

3. *Transport.*

14. Transport consists of the delivery of video content to viewing devices. Today, distributors use several different mechanisms (as well as various combinations of these mechanisms) to deliver video:

- *Dedicated networks:* Many distributors use private, dedicated networks for the delivery of programming. Such distribution can take many different forms, including distribution over: wireline networks operated by cable companies and telcos; direct broadcast satellites; local broadcast television stations; and specialized terrestrial wireless networks (e.g., FloTV).
- *Over the Internet:* Some firms distribute video programming over the Internet. Examples of internet distribution services include Amazon, CBS.com, Fancast, Hulu, iTunes, Netflix, TV.com, YouTube, and Vudu. These firms rely on underlying Internet backbone and local access networks to provide transport.<sup>27</sup> In some cases, these networks share significant facilities with dedicated video networks (e.g., cable and telco local network facilities can provide both dedicated video services and Internet access services). Firms relying on Internet transport often make use of content distribution networks (“CDNs”), such as Akamai and Limelight. CDNs improve performance by maintaining a large number of geographically diverse servers that connect to the Internet near end users’ locations, thereby reducing the distance between CDN customers’ content and end users.

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<sup>27</sup> MobilTV has a similar business model in that its video service is delivered over the infrastructure of general-purpose mobile telephone and data networks and associated access devices. See <http://www.mobity.com/products/apps/tvl/>, site visited April 29, 2010.

Similarly, large content distributors, such as Google, maintain server farms at geographically diverse locations.<sup>28</sup>

- *Via post and bricks and mortar outlets.* Companies such as Netflix, Redbox, and video rental stores distribute video programming via the physical transmission of DVDs to viewers.

4. *Content search and discovery.*

15. This cluster of activities is aimed at providing a consumer the information he or she needs to find out: (a) what programming is available; (b) when and where that programming is available; and (c) what programming is likely to satisfy the consumer's preferences. This information can be provided: by programming guides (on the television, online, or on wireless devices) offered by MVPDs; by the display device itself; by social networking sites, blogs, and other websites; or by other sources including newspapers and magazines. The associated activities involve collecting the relevant information and presenting it to consumers in a readily usable form.<sup>29</sup>

**B. Business models built around Internet transport of video take many forms and are rapidly evolving.**

16. As is evident to even the most casual observer, evolving technology and changing consumers' tastes are driving changes in the video marketplace, including rapid changes in the nature of online delivery of video content. As part of this evolution, potential service providers are experimenting with a wide variety of revenue models.

<sup>28</sup> John Markoff and Saul Hansell, "Hiding in Plain Sight, Google Seeks More Power," *The New York Times*, June 14, 2006, available at <http://www.nytimes.com/2006/06/14/technology/14search.html>, site visited April 27, 2010.

<sup>29</sup> In this last respect, there can be overlap with the user-interface activities described in the discussion of packaging and content presentation above.

17. The revenue models used in the marketplace today include:

- *Advertiser-supported Model:* In this model, advertisers pay the online distributor to show commercials to viewers; consumers view the video content free of charge. Examples include: YouTube, Hulu, AT&T Entertainment, various broadcast and cable network sites, Classic Cinema Online, Crackle, DCBeyond, SlashControl, SnagFilms, and Vimby.
- *Subscription Model:* In this model, consumers pay a periodic subscription fee for online access to video content. Examples include FloTV, MLB.com, MobiTV, NBA.com, Netflix, and NHL.com.
- *A la Carte Sales/Rentals:* In this model, consumers purchase or rent individual video programs online. Examples include Amazon, Apple's iTunes, Vudu, and Blockbuster.
- *Hybrid Models:* Combinations of these revenue models are also being tried, and distributors are increasingly exploiting multiple revenue sources, sometimes across multiple viewing platforms. Examples include Comcast's Fancast, which offers advertiser-supported video-on-demand online and other services, while some of the same content is available through Comcast's subscription MVPD service; Apple has an existing online rental/sale business through its iTunes store and is rumored to be considering a subscription service; YouTube is beginning to offer *à la carte* rentals in addition to its advertiser-supported site; Ireel has a subscription fee in addition to per-video rental or purchase fees.

18. Economic logic suggests that online business models that incorporate subscription fees and/or transaction-based pricing will almost certainly grow in importance. Just as broadcast television stations have increasingly been seeking cash retransmission consent payments from

MVPDs to supplement the broadcasters' advertising revenues,<sup>30</sup> online video providers can be expected to seek ways to generate revenue from subscriptions and transactions fees rather than rely solely on advertising revenues.

19. Video distribution business models that are based solely on advertising revenues may be limited in their ability to compete with distribution business models that have a subscription or transaction fee component instead of, or in addition to, advertising revenues. Content producers are rationally attracted to those business models that can generate the greatest economic returns for the programmers' investments. Although the advertising-only model may have a continuing role to play in the distribution of a selection of broadcast and cable network programming, there is little evidence that an advertising-only model will successfully support the distribution of broadcast and cable network programming at anything approaching the quality and variety available through traditional MVPDs.

20. Many industry analysts agree that advertising revenue alone will not support the development of online video. For example, one stated:<sup>31</sup>

We do not believe online video can be supported solely through the traditional display advertising model. Online video will not become a new platform in its own right, with only 3% of US TV ad-spend by 2012, and the profitability of online ventures could be drastically curtailed by high distribution costs and limited scale. We expect the model will have to evolve by factoring direct spending from the consumer, either subscription or à la carte.

21. Hulu's CEO and its content partners appear to believe that total reliance on advertising support is not the future of online video viewing,<sup>32</sup> and Hulu's actions speak louder than its

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<sup>30</sup> See *Israel and Katz Initial Declaration*, Section IV.C.

<sup>31</sup> Matthieu Coppet, *et al.*, "Can Pay TV Benefit From Online Video?" *UBS Investment Research*, June 22, 2009, at 3-4 (3<sup>rd</sup> Party Attachment 23). See also, Michael Nathanson, *et al.*, "Web Video: Friend or Foe... And to Whom?" *Bernstein Research*, October 7, 2009, at 11 (3<sup>rd</sup> Party Attachment 24), stating that fully advertiser-supported online content is likely to remain limited to broadcast content and limited cable network content.

words: apparently, Hulu plans to add a subscription service, Hulu Plus, through which users can access additional content not available on the purely advertiser-supported portion of Hulu. It has been reported in the press that this service may have a subscription price of \$9.95 per month and be introduced as soon as May 24, 2010.<sup>33, 34</sup>

**C. The characteristics of online video viewing are starkly different from the characteristics of traditional television viewing.**

22. As described above, consumers receive video programming through a variety of different delivery mechanisms and in many different forms, including both traditional television and online viewing.<sup>35</sup> Because Comcast Cable's main video service (as distinct from its high-speed data or phone services) is the provision of MVPD services to support traditional television viewing, Comcast's incentives regarding online video depend, among other things, on the extent to which traditional and online viewing serve the same consumer needs (and thus are substitutable for one another) or serve distinct needs (and thus are complementary services).

Market research on current usage patterns for online video viewing versus traditional television

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<sup>12</sup> See Brian Stelter, "Web-TV Divide is Back in Focus with NBC Sale," *The New York Times*, December 4, 2009 ("The site continues to be bullish on the current ad-supported model, but Mr. Kilar [Hulu's CEO] indicated that it was eyeing multiple business models for TV and movie viewing for the future."); "Sooner or Later, All of You Will Pay; From pay walls to authentication, media executives say the era of free is about to end," *Broadcasting & Cable*, October 26, 2009 (Hulu Board member Chase Carey (COO, News Corporation) said Hulu "needs to evolve to have a meaningful subscription model as part of its business."); "Disney CEO: Hulu could charge for content," *The Associated Press*, July 23, 2009 (Disney's CEO Robert Iger said "It's possible that Hulu will look at monetizing as well. It may be not just selling ads.").

<sup>13</sup> Dawn C. Chmielewski and Meg James, "Online video site Hulu to test pay subscriptions," *Los Angeles Times*, April 23, 2010.

<sup>14</sup> As explained in the subsequent sections, even if distributors such as Hulu move to subscription models, that change would not imply that they have become substitutes for traditional MVPDs. It means only that there is a movement away from the purely advertiser-supported business model. Whether subscription-based services will be complements to, or substitutes for, traditional MVPDs is a distinct question, and there is substantial reason to expect that the online subscription services may be complementary to those of traditional MVPDs.

<sup>15</sup> We define traditional television viewing to include broadcast television received over-the-air and television received via a cable, DBS, or telco MVPD.

viewing demonstrates that online video viewing patterns are starkly different from traditional television viewing patterns, which indicates that traditional and online viewing serve distinct consumer needs.

*1. Consumers watch much less online video than they watch traditional television.*

23. A striking fact is how much more time the members of an average household spend watching traditional television than they spend watching video delivered online to either a personal computer or a mobile device. Studies of this topic have found:

- “Each week the typical American consumes almost 35 hrs of TV, 2 hrs of timeshifted TV, 4 hrs of internet, 22 minutes of online video and 4 minutes of mobile video.”<sup>36</sup>
- “TV viewership has risen to over eight hours per household per day — the highest level ever.”<sup>37</sup>

24. The limited amount of online viewing highlights an important point—this is a brand new medium, not a mature industry. Notwithstanding the growth rate of online viewing, as yet only a relatively small portion of total video viewing is online. In the fourth quarter of 2009, online video accounted for only one percent of total video viewing minutes.<sup>38</sup>

*2. Traditional television viewing has clear peak times while online viewing does not.*

25. As seen in Figure 2, traditional television viewing (whether watched straight from the linear network or watched off of a DVR) clearly peaks between 6p.m. and 11p.m. In contrast,

<sup>36</sup> The Nielsen Company, “Three Screen Report,” Volume 7, 4<sup>th</sup> Quarter 2009, at 2 (3<sup>rd</sup> Party Attachment 25).

<sup>37</sup> Michael Nathanson, *et al.*, “Web Video: Friend or Foe... And to Whom?” *Bernstein Research*, October 7, 2009, at 14 (3<sup>rd</sup> Party Attachment 24).

<sup>38</sup> The Nielsen Company, “Three Screen Report,” Volume 7, 4<sup>th</sup> Quarter 2009, at Table 1 (3<sup>rd</sup> Party Attachment 25). Video viewing minutes include viewing of live and time-shifted television and online video.

online streaming of videos is much steadier throughout the day from 8a.m. to 11p.m. Hence, in addition to the fact that there is substantially more traditional television viewing than online viewing, traditional television viewing is more concentrated in a narrow time window, meaning that networks used to transport traditional television need to be able to deal with high volumes of usage concentrated at peak times. Given that there may be multiple televisions in a single household simultaneously receiving different signals, the amount of data flowing to the household, particularly during peak usage hours, may be quite high.<sup>39</sup> As explained below, telcos' standard DSL networks may lack sufficient bandwidth to individual households to support more than one high-definition video stream at a time, substantially limiting their ability to support online video viewing that mirrors today's patterns of television viewing.

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<sup>39</sup> The viewing data presented above indicate that the average American watches five hours of television per day, while the average household consumes eight hours per day, which is consistent with there being multiple television streams into a given household.

**Figure 2: Audience by Day-Part<sup>40</sup>**

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3. *Online video sites offer video-on-demand but not linear networks.*

26. Video programming can be delivered in different forms, including linear networks and on-demand. When programming is distributed in the form of linear networks, the real-time flows of video are controlled by the distributor (*e.g.*, a local broadcast television station), and a household must conform its viewing times to the schedule set by the distributor unless the household records the programming and engages in time-shifting. In an on-demand system, a household is able to access the programming from the distributor at any time the household wishes to do so.

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<sup>10</sup> Nielsen Video Census, Combined Home and Work, Npower Live + 7, March 1-31, 2009 (reproduced from Jon Gibs and Howard Shimmel, "Cutting the Cord? Unraveling the Relationship Between TV and Streaming Video," *The Nielsen Company*, April 25, 2009, at 18.) (3<sup>rd</sup> Party Attachment 26).

27. A fundamental difference between online and traditional viewing today is that, although traditional television viewing has been largely built around linear networks (with recent growth in video-on-demand services), the vast majority of online viewing is on-demand.<sup>41</sup>

*4. Online viewing tends to be sporadic while television viewing tends to be continuous.*

28. The large differences in viewing times for online viewing and traditional television viewing, as well as the lack of online linear networks, are consistent with the ways in which people use online and traditional television viewing. As described by Comcast personnel, online viewing can be characterized as “default off” (*i.e.*, consumers go online only to seek particular programming at distinct points in time), while television viewing can be characterized as “default on” (*i.e.*, consumers leave the television on and flip channels to find something to watch).<sup>42</sup>

*5. Consumers use online viewing to supplement traditional television viewing.*

29. Not surprisingly, given the sharp differences in usage patterns, households today do not generally use online video sources as a replacement for traditional television viewing, but rather use online video in ways that supplement their traditional television viewing. For example, they watch missed episodes of serially televised programs and thus more fully appreciate future episodes. Similarly, consumers can use online video to keep up with a serially televised program while traveling. Many networks offer short web exclusives and online “behind the scenes” clips for specific shows that are aimed at supplementing, not replacing, the consumer’s primary viewing experience on television. Another use of online video delivery is to engage in personalized viewing (as opposed to collective, family viewing in the living room).

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<sup>41</sup> Derek Harrar, SVP GM Video and Entertainment Services, Comcast Corporation, May 2, 2010, interview.

<sup>42</sup> Matt Bond, Executive Vice President of Content Acquisition for Comcast Cable, March 24, 2010, interview.

30. Multiple sources describe the use of online television in ways that supplement, rather than replace, traditional television viewing. For example, “[a]ccording to a recent study conducted by Nielsen, Americans watch network TV programs online to catch up with programming or if the TV itself is unavailable. It is not typically as a replacement for TV viewing.”<sup>43</sup> And a recent Nielsen survey regarding reasons for watching TV shows on the Internet found that:<sup>44</sup>

- 54% of respondents list “forgot to watch a specific episode when it aired on TV,”
- 47% of respondents list “catching up on the current season of programming because I missed a large number of episodes,”
- 33% of respondents list “catching up on a past season of a program before the next season airs,”
- 32% of respondents list “forgot to record a specific episode with my DVR or TiVo when it aired on TV,”
- 18% of respondents list “Another member of my household watches another program at the same time the show I want to watch is on,”
- 12% of respondents list “watch TV programming online when I am at work,” and
- 12% of respondents list “watch TV programming online when I travel.”

31. One industry analyst summarized the use of online viewing to supplement (rather than supplant) “the core TV” as follows:<sup>45</sup>

People tend to multi-task online and therefore watch much shorter video clips on their computers (that is, a single TV show or less, on average). In contrast, the living room TV remains the dominant venue for viewing long-form content. Given the marked contrast in viewing habits, we believe that online video is currently augmenting total TV viewership at the “short clip” end of the spectrum, as opposed to outright cannibalization. Our interpretation is supported by the observation that 74% of online viewers do so on their computer monitors —

<sup>43</sup> The Nielsen Company, “Three Screen Report,” Volume 7, 4<sup>th</sup> Quarter 2009, at 5 (3<sup>rd</sup> Party Attachment 25).

<sup>44</sup> Jeff Herrmann, *et al.*, “TV Networks Online,” *The Nielsen Company*, February 2, 2010, at 25 (3<sup>rd</sup> Party Attachment 27). Nielsen surveyed 483 online viewers, but the sampling methodology is not disclosed.

<sup>45</sup> Michael Nathanson, *et al.*, “Web Video: Friend or Foe...And to Whom?” Bernstein Research, October 7, 2009, at 33 (3<sup>rd</sup> Party Attachment 24).

without connecting to the TV. This is consistent with the theory that Internet TV viewing is still more of a second-screen experience, and not supplanting the core TV.

6. *A given viewer is likely to utilize multiple online video sites but only one MVPD.*

32. Traditionally, viewers have relied on a single subscription to one MVPD to provide them with all of the content that they view on television. However, in the case of online video, this is not typically the case. Consumers can and do make use of the easy search and navigation properties of the Internet to patronize multiple web sites to obtain video, including websites that aggregate content and show it on an advertiser-supported basis (*e.g.*, Hulu, Fancast, and TV.com), websites that sell or rent content (*e.g.*, Amazon), and the websites of individual networks or shows (*e.g.*, ABC.com, NBC.com, ComedyCentral.com, and SouthParkStudios.com). The practice of patronizing multiple programming platforms or sites is known as *multi-homing*. An important implication of multi-homing is that, because consumers do not rely solely on one-stop shops, an online video distributor does not have to offer a full or even broad array of programming in order to attract consumers. Instead, a web site may be able to attract a large number of consumers while offering only a limited selection of programming because those consumers will also patronize other sites to obtain access to the additional video programming that they desire. This process can be—and is—facilitated by online search engines as well as other online resources that allow consumers easily to navigate among multiple sources.

33. An additional implication of multi-homing is that the success of online television is not dependent on the success of any single distributor, including Hulu. The fact that online television distribution is not dependent on Hulu is evidenced by Viacom's decision to remove all

Comedy Central content (including *The Daily Show* and *The Colbert Report*) from Hulu.<sup>46</sup> Press reports indicate that Viacom and Hulu could not agree on an acceptable split of advertising revenue.<sup>47</sup> Apparently, Viacom did not believe that it would lose enough viewers by removing its content from Hulu to make this move unprofitable.<sup>48</sup> It is also worth noting that Hulu added links on its website to *TheDailyShow.com* and *ColbertNation.com*.<sup>49</sup> If a hypothetical future website were to lack certain content for whatever reason, then it could potentially maintain the value of its aggregation services by mimicking this Hulu strategy and providing links to other sites where the content could be accessed.<sup>50</sup>

#### D. Broad implications of television viewing patterns

34. The viewing characteristics and trends that we have identified in the section above have important implications for the relationship between online video distribution services and Comcast's cable and broadband Internet access businesses.

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<sup>16</sup> On March 2, 2010, the companies announced that they had been unable to reach an agreement and that Viacom would pull Comedy Central programming from Hulu on March 9, 2010. Viacom noted that it would continue to stream full episodes of certain programs on websites associated with the shows. See Brian Stelter, "Viacom and Hulu Part Ways," *The New York Times*, March 2, 2010.

<sup>17</sup> Meg James, "Cable comics leaving Hulu; Comedy Central will pull Jon Stewart's and Stephen Colbert's shows off the website over ad revenue split," *Los Angeles Times*, March 3, 2010.

<sup>18</sup> See, e.g., Nat Worden, "Viacom CEO on Hulu: Not Enough In It For Us," *Dow Jones Business News*, March 9, 2010; Mike Farrell, "Dauman: Viacom Could Return to Hulu: But CEO Asks 'What's In it For Us?'" *Multichannel News*, March 9, 2010.

<sup>19</sup> We understand that for content it does not host on the Hulu.com site, Hulu generally links to programmer websites. It has done so with CBS and TBS content, neither of which is hosted by Hulu.

<sup>20</sup> One might ask whether NBCU would pull its programming off all online sites. {{

}} (Jean-Briac Perrette, President, Digital & Affiliate Distribution/Content Distribution Strategy, NBCU April 30, 2010, interview.) In addition, to the extent that an online presence is complementary to television viewing, pulling programming off all online sites (including NBCU's vertical sites like NBC.com) could be quite costly to NBCU.

1. *Online video distribution services today generally are complements for the services offered by traditional MVPDs and broadcast and cable networks, and complementarities are likely to continue to exist.*

35. Although the precise evolution of the online video sector is impossible to predict, economic logic applied to the available evidence indicates that online video currently has and will retain important complementarities with Comcast's MVPD business and Comcast's and NBCU's networks. These complementarities must be accounted for in any analysis of the joint venture's incentives with respect to online video providers.

36. As a result of the distinct uses of traditional television and online video—with online video serving to supplement traditional television viewing—online video distribution currently is primarily an economic complement to, rather than substitute for, traditional MVPD services (in addition to being a complement to the offerings of broadcast and cable networks). To the extent that online video is complementary to traditional MVPD video services, Comcast has an incentive to encourage NBCU to make *more* content available online, which will benefit Comcast Cable through expanded television viewing.

37. The complementary nature of online viewing is consistent with the lack of evidence that significant numbers of households have cancelled MVPD subscriptions and substituted online viewing (known in the industry as “cord cutting”). As depicted in Figure 3, despite growth in video content available online, the number of MVPD subscribers has continued to grow in recent years, both in absolute terms and as a percentage of television households. This is not to say that no one has cut the cord, but rather that, to the extent that there is cord cutting, it is swamped by the overall growth in MVPD subscriptions, which supports the view that online viewing is currently complementary to traditional television.

**Figure 3: Growth in MVPD Subscribers, 2008-2009**

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38. The following excerpts from a recent analyst report are quite clear that there is no evidence for cord cutting in “the numbers”:<sup>51</sup>

Pay TV industry subscriber growth appears to have accelerated. ... *there is simply no empirical evidence at all of video cord cutting.* ... For the full year 2009, the major Pay TV industry players (excluding only Cox among the majors), added 2.2M subscribers, versus 1.8M additions for the same sub-set of providers a year

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<sup>51</sup> Craig Moffett, *et al.*, “Quick Take – Pay TV Industry Continues to Grow...In Fact, It Accelerates. Still No Signs of Cord Cutting,” *Bernstein Research*, March 1, 2010, at 1 and 2 (3<sup>rd</sup> Party Attachment 28). [Emphasis in original.]

For additional analysis, see Jon Gibs and Howard Shimmel. “Cutting the Cord? Unraveling the Relationship Between TV and Streaming Video,” *The Nielsen Company*, April 25, 2009, at 6 (3<sup>rd</sup> Party Attachment 26), which concluded that “[o]nline video is changing the nature of Internet use-- consistently drawing larger audiences and time. All evidence suggests that this growth is happening in tandem with TV growth, rather than at its expense” and “[w]hile some populations are shifting time from TV to the Internet, that population is less than a third of those who access streaming content and, of those who do shift time, that vast majority has shifted 5 percent or less of their time.”

ago. For reference, the group represented in our calculation accounts for about 90% of the U.S. market. ... The fear of video cord-cutting has been an overhang for all Pay TV stocks for the better part of a decade. Multiples in the sector imply a zero growth future. And yet, by all empirical evidence, cord-cutting remains the province of urban legend. There is simply no sign of it in the numbers.

39. Internal analyses by both Comcast and NBCU have reached the same conclusion. For example, an NBCU Study concluded:<sup>52</sup>

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Similarly, an analysis performed for Comcast noted:<sup>53</sup>

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40. In addition to being complementary to Comcast's cable operations, existing online video services are also complementary to NBCU's and Comcast's broadcast and cable networks, providing an additional incentive for the joint venture to support online video. Multiple NBCU analyses support the conclusion that existing online video services are complementary to broadcast and cable networks. For example, [[

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<sup>52</sup> NBC Universal, {{ }} (NBCU Attachment 7).

<sup>53</sup> Frank N. Magid Associates, Inc., {{ }} (Comcast Attachment 7). [Emphasis in original.]

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An NBCU survey of NBC.com viewers indicates that making content available online increases viewers’ overall participation with the shows. In particular, among respondents:<sup>55</sup>

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41. As we have discussed above, the online video marketplace is evolving and can be expected to continue to change. One might speculate that, contrary to current usage patterns and business models, online video distributors may become viable substitutes for traditional MVPDs for significant numbers of consumers at some undetermined future date. Even if this were to happen, there are strong grounds for expecting that online video offerings would also continue to have characteristics that make them complementary to traditional MVPD offerings. Specifically, it can be expected that online video providers will try to differentiate themselves from traditional MVPDs in order to obtain a competitive advantage and achieve profitability. Online video

<sup>54</sup> NBC Universal, {{ (NBCU Attachment 8). [Emphasis in original.]

<sup>55</sup> NBC Universal, {{ (NBCU Attachment 8). {{

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providers may accomplish this differentiation, in part, by incorporating some of the unique capabilities of online platforms that allow them to supplement and complement traditional MVPD offerings. Online video providers may also make use of innovations involving various activities in the vertical chain, including new user-interfaces or advances in search and discovery methods. It is natural to expect that, as part of this differentiation strategy, future online offerings will continue to include elements that are complementary to the services offered by traditional MVPDs. For example, to the extent that Apple's iPad or similar products are a part of the future of online video, they could offer an experience quite different from that offered by traditional MVPDs—one that might provide a portable complement to traditional television viewing for many users.

2. *Online video viewing that mirrored traditional television viewing levels and patterns would strain current Internet access networks but would complement future networks.*

42. Another important implication of the differences between online and traditional viewing is that, if online video viewing were to change in character to the point that it mirrored traditional television viewing levels and patterns, then it would create large transport costs for online providers (based on current prices) and would place burdens on broadband Internet access networks that would lead to substantial congestion and associated degradation in service quality for most of today's broadband Internet local access networks. However, if broadband Internet access networks sufficiently evolve such that they can support online video viewing that mirrors traditional television at a low cost, then the increase in demand for broadband Internet access services due to video viewing would, as a matter of economics, be expected to enhance broadband Internet access providers' profits.

43. As discussed above, consumers spend many hours each day watching traditional television. Tony Werner, Chief Technology Officer of Comcast Cable, has estimated the demands that supporting this level of television viewing using Internet distribution would place on broadband access networks.<sup>56</sup> If a household were to watch eight hours of television content per day online, of which [ ] percent was high definition, then the household would download more than 288 gigabytes (“GB”) of data per month to support that viewing.<sup>57</sup> In contrast, the average household with a Comcast high-speed data subscription currently downloads only approximately two to four GB per month, roughly one hundredth as much.<sup>58</sup>

44. At current prices, the content distributor’s transport costs associated with 288 GB of data would be substantial. NBCU indicates that its current cost for CDN services is approximately { } per GB.<sup>59</sup> At this rate, the cost of distributing 288 GB of data per month would be \${{ } } per month. {{

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<sup>56</sup> Tony Werner, Chief Technology Officer, Comcast Cable, April 29, 2010, interview.

<sup>57</sup> This is based on assumed bandwidth requirements of 6,000 kilobits per second (“Kbps”) for high-definition video and 2,000 Kbps for standard-definition video. Mr. Werner stated that Comcast estimates that, at present, approximately [ ] percent of viewing minutes (both linear and video on demand) are high definition, and Comcast expects the proportion of content viewed in high definition to increase steadily due to increased penetration of high-definition set-top boxes and televisions, increased availability of high-definition content, and the ability of program guides to point users to high-definition content. (Tony Werner, Chief Technology Officer of Comcast Cable, April 29, 2010, interview.)

<sup>58</sup> Comcast Corporation, “Frequently Asked Questions about Excessive Use,” available at <http://customer.comcast.com/Pages/FAQViewer.aspx?eqs=6B62420B00423BB1FC7B32A97CEDE45903379DB20342594D7F63B3776D141381F23A7699F4E5726EB662F761883823A3#excessive>, site visited April 25, 2010.

<sup>59</sup> Marc Siry, SVP, Digital Products & Services, NBCU, April 7, 2010, interview. { } See Matthieu Coppet, et al., “Can Pay TV Benefit From Online Video?” *UBS Investment Research*, June 22, 2009, Table 7 (3<sup>rd</sup> Party Attachment 23).

<sup>60</sup> Glenn Reintmeier, SVP, Technology Standards & Strategy, NBCU, April 29, 2010, interview.

45. In addition to generating high overall data volumes, traditional television viewing tends to be concentrated during prime-time hours. Moreover, popular live events, such as the Super Bowl, can create very large traffic peaks.<sup>61</sup> Given current network capacity limitations, these viewing peaks could overwhelm broadband Internet local access networks. In particular, broadband Internet local access networks can experience congestion if even only a relatively small percentage of customers in a given geographic area simultaneously attempt to stream video. For example, in Comcast’s local access networks (as currently configured), approximately 275 cable modems share access to each downstream port in a cable modem termination system (“CMTS”).<sup>62</sup> Associated with each port is one or more “downstream

<sup>61</sup> To date, the traffic volumes associated with online viewing of live events pales in comparison to what would occur under traditional television viewing patterns. For example, YouTube’s largest live streaming event was a U2 concert in October 2009. Google recorded nearly 10 million streams from around the world over the 2.5-hour event. (“U2 concert is YouTube’s largest streaming event,” *Associated Press*, October 29, 2009, available at [http://www.msnbc.msn.com/id/33539555/ns/technology\\_and\\_science-tech\\_and\\_gadgets/](http://www.msnbc.msn.com/id/33539555/ns/technology_and_science-tech_and_gadgets/), site visited April 26, 2010.) This is less than the number of viewers in the United States alone for a typical airing of a top-20-rated television show. The 20<sup>th</sup>-most watched primetime broadcast of the week of April 12-18, 2010, was “NCIS: Los Angeles,” with 10.43 million viewers. (“Top 20 Prime-Time TV Programs for April 12-18,” *Associated Press*, April 20, 2010, available at <http://abcnews.go.com/Entertainment/wireStory?id=10429818>, site visited April 26, 2010.) The week prior to the U2 concert, the 20<sup>th</sup>-most watched primetime program was “The Mentalist,” with 11.79 million viewers. (“Top 20 Prime-Time Programs in the Nielsen Ratings,” *Associated Press*, October 27, 2009, available at <http://abcnews.go.com/Entertainment/wireStory?id=8929591>, site visited April 26, 2010.) Assuming that the viewers of a typical top-20 rated television program are geographically dispersed in a pattern similar to the American viewers of YouTube’s stream of the U2 concert, a typical top-20 rated television show would create a greater burden for broadband Internet local access networks than even the largest YouTube streaming event. Because the top-20 rated television show would air at different times in different time zones, a single streaming event, which airs simultaneously nationwide, may place more burden on the Internet backbone. Popular live television events, such as the Super Bowl, would create particularly large burdens on both local access networks and the Internet backbone.

<sup>62</sup> Tony Werner, Chief Technology Officer of Comcast Cable, April 28, 2010, interview. Comcast describes CMTS as

[a] piece of hardware located in a cable operator’s local network (generally in a “headend,” Section 2.10) that acts as the gateway to the Internet for cable modems in a particular geographic area. A simple way to think of the CMTS is as a router with interfaces on one side leading to the Internet and interfaces on the other connecting to Optical Nodes and then customers, in a so-called “last mile” network.

(Chris Bastian, *et al.*, “Comcast’s Protocol-Agnostic Congestion Management System,” *Internet Engineering Task Force*, February 10, 2010, 4, available at <http://tools.ietf.org/html/draft-livingood-woundy-congestion-mgmt>, site visited April 23, 2010, Section 2.2.)

channels” through which cable modems in Comcast subscribers’ homes can download data.<sup>63</sup> Today, capacity in one downstream channel is limited to 38.75 megabits per second (“Mbps”).<sup>64</sup> Thus, seven high-definition video streams running simultaneously through one downstream channel would exceed its capacity.<sup>65</sup> Historically, Comcast’s network has had one downstream channel per CMTS port, meaning that if there were 275 cable modems on that port, they would all be sharing the 38.75 Mbps downstream channel, in which case, if just 2.5 percent of the modems in a geographic area were simultaneously downloading high-definition video streams, then usage would exceed network capacity. Today, up to four downstream channels may be delivered out of one CMTS port, but even if this were to quadruple the capacity of CMTS ports, then (given 275 modems per port) if 10 percent of the modems in a geographic area were simultaneously downloading high-definition video streams, usage would exceed network capacity.<sup>66</sup>

46. The problem of congestion is not unique to Comcast. Other cable networks would face similar issues, and telcos’ wireline Internet local access networks generally would face congestion at various points as well.<sup>67, 68</sup> Today, telcos’ standard DSL networks often face an

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<sup>63</sup> Tony Werner, Chief Technology Officer of Comcast Cable, April 28, 2010, interview.

<sup>64</sup> *Id.*

<sup>65</sup> This is based on the assumption that high-definition video consumes 6,000 Kbps. Actual bit rates can range between four and eight Mbps. (Tony Werner, Chief Technology Officer of Comcast Cable, April 23, 2010, interview.)

<sup>66</sup> Comcast has the ability to add more CMTS ports to its networks over time. However, as configured today and for at least the next few years, Comcast’s broadband Internet local access networks would very likely suffer from congestion from the simultaneous downloading of high-definition video signals by even a relatively small percentage of all consumers in a geographic area. (Tony Werner, Chief Technology Officer of Comcast Cable, April 28, 2010, interview.)

<sup>67</sup> Glenn Reitmeier, SVP, Technology Standards & Strategy, NBCU, April 29, 2010, interview.

additional constraint: many such networks can support download speeds into a single home of only six to seven Mbps, which implies that they could not support two televisions' receiving different high-definition signals in a single household, a limitation that would substantially hinder (or destroy) an online video provider's ability to replicate traditional television in many DSL households.<sup>69</sup> Today's mobile data networks also would struggle to serve the needs of a large number of television viewers. Current 3G mobile networks have bit rates that can handle standard-definition video, but not high-definition. Moreover, as demonstrated by the congestion that AT&T Wireless has suffered in part because of the demands of iPhone users, overall network capacity today would be insufficient to accommodate large numbers of users watching television in traditional amounts on devices attached to mobile data networks.

47. When bandwidth demands exceed capacity, users experience slower or degraded delivery of content. For example, online video could suffer from "freezing" while the next image is being downloaded. Such conditions are unlikely to be acceptable to consumers who are thinking of

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<sup>68</sup> Even if some local access networks did have the capacity to carry video programming in patterns and levels that mirrored traditional television viewing, a potential online distributor would still face high CDN costs and might find it difficult and expensive to market a service that could be enjoyed only by the customers of certain Internet access networks or even by only those customers living in certain areas served by those particular networks.

<sup>69</sup> America's largest DSL provider, AT&T, can support download speeds of only six Mbps, and America's second largest DSL provider, Verizon, can support download speeds of only seven Mbps. See AT&T, High Speed Internet Access, available at <http://www.att.com/gen/general?pid=6431> site visited May 1, 2010; Verizon, High Speed Internet: Plans, available at <http://www2.verizon.com/Residential/HighSpeedInternet/Plans/Plans.htm>, site visited May 1, 2010; Leichtman Research Group, "4.1 Million Added Broadband from Top Cable and Telephone Companies in 2009," March 12, 2010, available at <http://www.leichtmanresearch.com/press/031210release.html>, site visited May 1, 2010.

These figures do not apply to AT&T's U-Verse Service and Verizon's FiOS, which collectively pass less than one-third of U.S. households. AT&T U-Verse passed 22.8 million homes at the end of 2009. (AT&T Inc., Form 10-K for the fiscal year ended December 31, 2009, at 2.) Verizon FiOS passed 15.6 million homes in the first quarter of 2010. (Verizon Communications, Inc., Form 10-Q for the quarterly period ended March 31, 2010, at 16.) There were approximately 115.9 million television households in the United States in 2009. (SNL Kagan, "SNL Kagan's 10-Year Multichannel Projections, 2008-2019" (3rd Party Attachment 16).)

replacing their traditional MVPD service with an Internet-delivered alternative. As one analyst concluded, today and for at least the near future, “[b]roadband constraints make it impossible to offer true HD [high-definition] online for most consumers today, and the bandwidth required to stream and download HD video content will make online HD video inaccessible for many consumers...”<sup>70</sup>

48. In the future, Internet access networks may develop the capacity to handle the approximately hundred-fold increase in data traffic associated with a household’s viewing online video in a way that mirrors traditional television viewing without those networks’ suffering a loss in quality. To the extent that the broadband Internet access networks develop this capacity, the additional demand for broadband access services that would be created by such viewing would very likely enhance the profits earned by Comcast and other broadband Internet access providers. A proper analysis of Comcast’s incentives to support or hinder the development of online video services cannot ignore this complementarity between online video distribution services and Comcast’s broadband Internet access services.

### **III. APPLICATION OF THE COMMISSION STAFF FORECLOSURE METHODOLOGY TO FORECLOSURE OF ONLINE DISTRIBUTION RIGHTS**

49. Commission staff requested that we conduct an economic analysis of whether the proposed transaction would result in Comcast’s having the ability profitably to withhold programming from online video distributors in order to weaken their ability to compete with Comcast’s cable services. As discussed in Section II.D.1 above, online video services today largely complement—rather than compete with---Comcast’s cable services. In addition, whether

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<sup>70</sup> Elizabeth Curtis, *et al.*, “U.S. Internet Video 2008-2012 Forecast and Analysis: Revenue Boom or Bust? Or Something in Between?” *IDC*, November 2008, at 9 (3<sup>rd</sup> Party Attachment 29).

or not online video services complement Comcast’s cable services, third-party online video distributors’ services increase the demand for Comcast’s high-speed data services. For both of these reasons, any concern that Comcast would have an incentive to disadvantage online video services must be based on predictions that marketplace conditions will fundamentally change. Comcast would have no incentive to attempt to weaken online video distributors by trying to induce NBCU to withhold programming from them as long as those distributors offered services that largely complemented Comcast’s cable and broadband Internet access services.

50. Given that, overall, online video services are currently complementary to traditional MVPD services—and there are reasons to expect such complementarity to continue—we interpret the Commission staff’s request for an economic analysis of whether the proposed transaction would give the joint venture the incentive and/or ability to disadvantage an online rival as asking us to *assume* the emergence of one or more hypothetical online distributors that offer potential replacements for traditional MVPD services. We label such a competitor an “online MVPD.”<sup>71</sup> Because no such company exists today, assumptions about the contours of an online MVPD’s services and the nature of its business model necessarily are speculative.<sup>72</sup> In order to provide focus to what could otherwise be an entirely amorphous exercise, we assume that an online MVPD has the following characteristics:

- the online MVPD delivers video content broadly comparable to that of a traditional MVPD (*e.g.*, a mix of on-demand and linear content, including some major live events), and

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<sup>71</sup> We do so as a convenient shorthand. We offer no opinion on whether any such entity would meet the statutory definition of an MVPD.

<sup>72</sup> Any concerns that the proposed joint venture would harm such a company are also speculative.

- consumers view the online MVPD service (coupled with a broadband Internet access service) as a substitute for traditional MVPD service, meaning that consumers are willing to replace their traditional MVPD with the combination of an online MVPD and a broadband Internet access service, using the online MVPD for their *television* viewing, not just viewing on a personal computer or mobile access device.<sup>73</sup>

51. For the reasons discussed above, it is not evident that an online offering that is directly competitive with traditional MVPD services will emerge, at least for the next several years. For instance, the rights thicket discussed in Section II.A.2 above could make it difficult to put

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As analyzed below, a hypothetical online MVPD might cause some existing traditional-MVPD subscribers to engage in cord cutting. A more narrowly focused online video distributor with a limited set of program offerings might stimulate “cord shaving,” whereby consumers subscribe to a traditional MVPD for their baseline service but buy fewer supplementary services (e.g., premium, pay networks) than they would have done in the absence of online video options. For example, Netflix’s online movie service may reduce the demand for HBO’s and Starz’s subscription services offered through traditional MVPDs.

The analysis presented in the remainder of this declaration does not focus on cord shaving. This is so because cord shaving does not appear to be relevant to an analysis of the competitive effects of the proposed transaction. Even if it wanted to do so, Comcast would have little ability to use NBCU programming to limit cord shaving. To see why, first suppose that online providers assembled packages of content that generally appears only on the higher-value tiers offered by traditional MVPDs and, hence, might reduce subscriptions to those higher-value tiers. NBCU’s most popular cable networks (i.e., Bravo, CNBC, MSNBC, SyFy, and USA) are each carried on analog tiers over 11–14 percent of the time. (Based on analysis of data from Warren Communications News. Details of the calculations are reported in Backup Attachment 11.) Published studies have used the distinction between analog and digital tiers as a metric for tier-carriage decisions. (See, e.g., Dong Chen and David Waterman (2007), “Vertical Ownership, Program Network Carriage, and Tier Positioning in Cable Television: An Empirical Study,” *Review of Industrial Organization*, 30, 227-251.) Given the positioning of these networks, online video providers pursuing this business model would very likely have little or no demand for NBCU’s networks and, thus, would not be affected by any loss of access to those networks.

Alternatively, one might hypothesize that online providers will assemble packages of movies, thereby potentially limiting traditional MVPDs’ revenues from video-on-demand or from premium channels such as HBO. Although the proposed joint venture includes Universal Studios, it is important to recognize that, over the last five years, Universal Studios has ranked sixth among studios in domestic box office receipts, with a share of only 10.1 percent. (Box Office Mojo, “Studio Market Share,” 2005-2009, available at <http://www.boxofficemojo.com/studio/?view2=yearly&view=company&p=.htm>, site visited April 30, 2010. Details of the calculations are in Backup Attachment 11.) Over that period, Universal has produced only two movies that ranked in the top ten in terms of domestic box office for any year: King Kong in 2005 and Bourne Ultimatum in 2007. (Box Office Mojo, “Yearly Box Office,” 2005-2009, available at <http://www.boxofficemojo.com/yearly/>, site visited April 30, 2010. Details of the calculations are in Backup Attachment 11.) Hence, there is not a sound basis on which to conclude that withholding Universal Studios content from an online provider would significantly limit its ability to attract customers.

together a compelling package of programming. Moreover, as discussed in Section II.D.2, the likely congestion in broadband Internet local access networks and the high costs associated with the use of CDNs would make it difficult and/or costly to offer such a service today.

52. Despite the difficulties associated with forming a viable online MVPD, we respond to the Commission staff's request by assuming a hypothetical scenario in which one or more online MVPDs has come into being and profitably offers consumers an attractive value proposition.<sup>74</sup> In the context of this hypothetical scenario, we consider whether Comcast would have the ability and incentive to induce the joint venture to withhold NBCU programming from an online MVPD in order to weaken its ability to compete.

53. It is important to observe that there could be several reasons why—even absent the transaction—NBCU would fail to reach a deal with an online MVPD (*e.g.*, the online MVPD might refuse to make an offer that NBCU finds compelling even holding aside any consideration of effects on Comcast). Such failures to reach a deal manifestly are not foreclosure. In what follows, we consider a situation in which the online MVPD is willing to pay compensation to NBCU for its content that is in line with what is paid by other MVPDs.

54. For the purposes of our analysis, we evaluate a scenario in which the post-transaction

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<sup>74</sup> If the online MVPD were unprofitable or only marginally profitable (on a forward-looking, expected-net-present-value basis) absent foreclosure, then that firm would pose little competitive threat to Comcast and offer little expected benefits to consumers because the firm would be unlikely to survive and/or develop into a significant rival. Hence, Comcast would not have a financial incentive to engage in costly actions to weaken such an online MVPD.