Introduction

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Traditional Cable UI Technology

- Time Warner Cable offers digital video services via the use of a digital terminal device or Set-Top Box (STB).
- A STB is designed for video decode, CA decryption, and display of the user interface.
- STB = $$$ - limited CPU and memory
- UI is provided by a monolithic application
- Two-way communication is limited, thus broadcast technologies are used to “carousel” data to each STB.

Consumer Owned Devices

- Providing video services to Consumer Owned Devices (CODs) has proven difficult because of the limitations of the current environment, content protection requirements, and the complexity of the operators monolithic applications.
- SmartTVs, PCs, Laptops, Tablets, Game Consoles, and Smartphones are examples of the many type of devices that consumers desire to use for video services.
- These devices support different operating systems and environments requiring a large (read: expensive) effort to fully support all devices.

Home Networking

- Networking technology has increased the connectivity for devices within the home and allows for robust two-way interaction to all points outside of the home.
- The increase in bandwidth allows for a more interactive experience
- Application logic that has been traditionally embedded into a digital STB can now be moved into the cloud.
- Data that is delivered into the home via broadcast technologies can be accessed real-time on demand.
- User interface elements that are embedded into the STB and be fetched real time and updated as needed with little or no impact to the user experience.

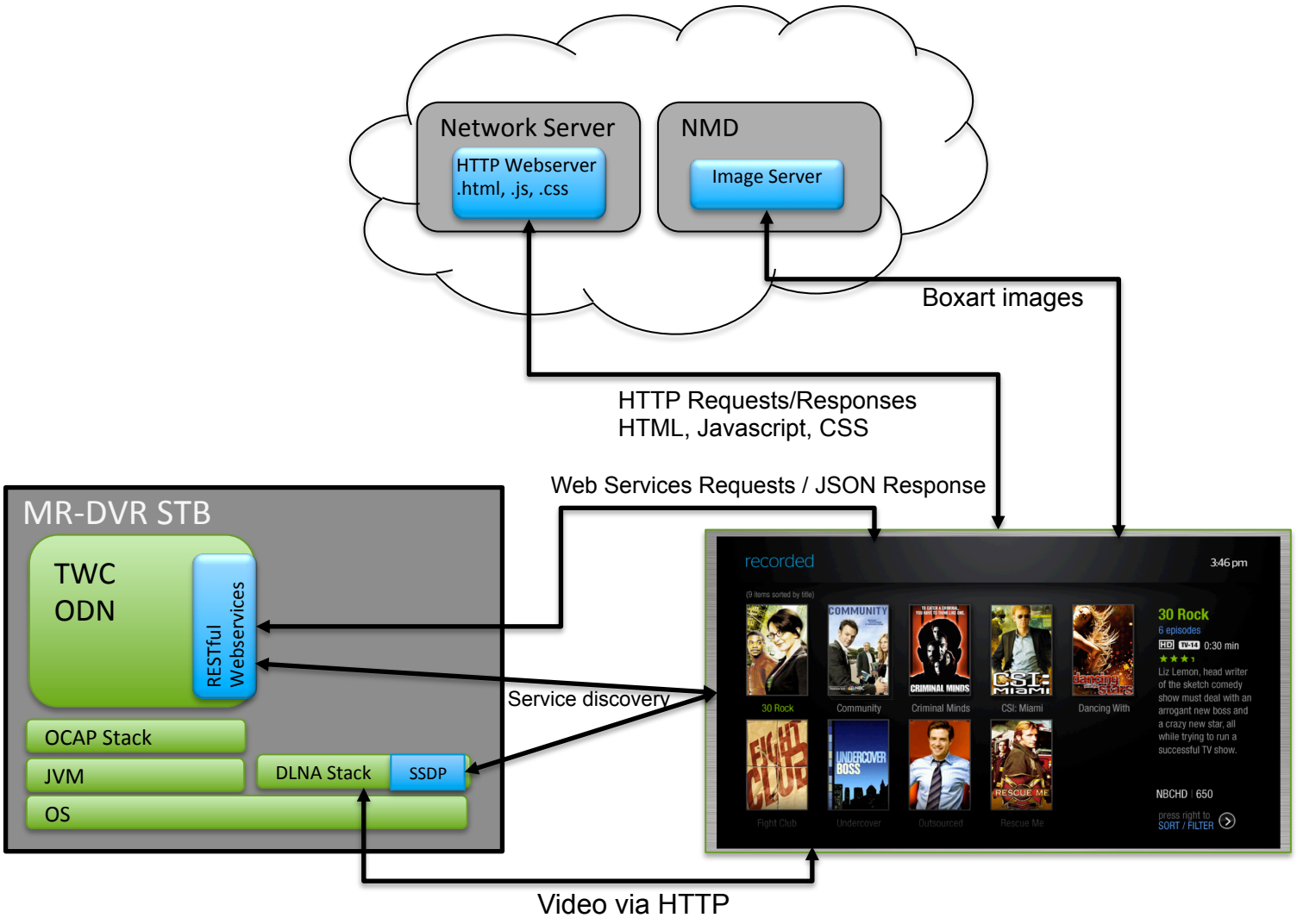
Web Technologies

- The common application environment among the many devices can be web technologies.
- New classes of devices are being released to the market with a web browser or a web based application environment by default.
- The ability for operators to develop the user experience using tools and technologies that are as pervasive as HTML5, CSS, and Javascript allows for rapid development.
- Combined with high-speed network access these tools allow video providers the ability to break away from the traditional development methodology and embrace cloud-based, web-based user experience design.
- These technologies are not just for consumer owned devices, but can and will be used for next-generation STBs.

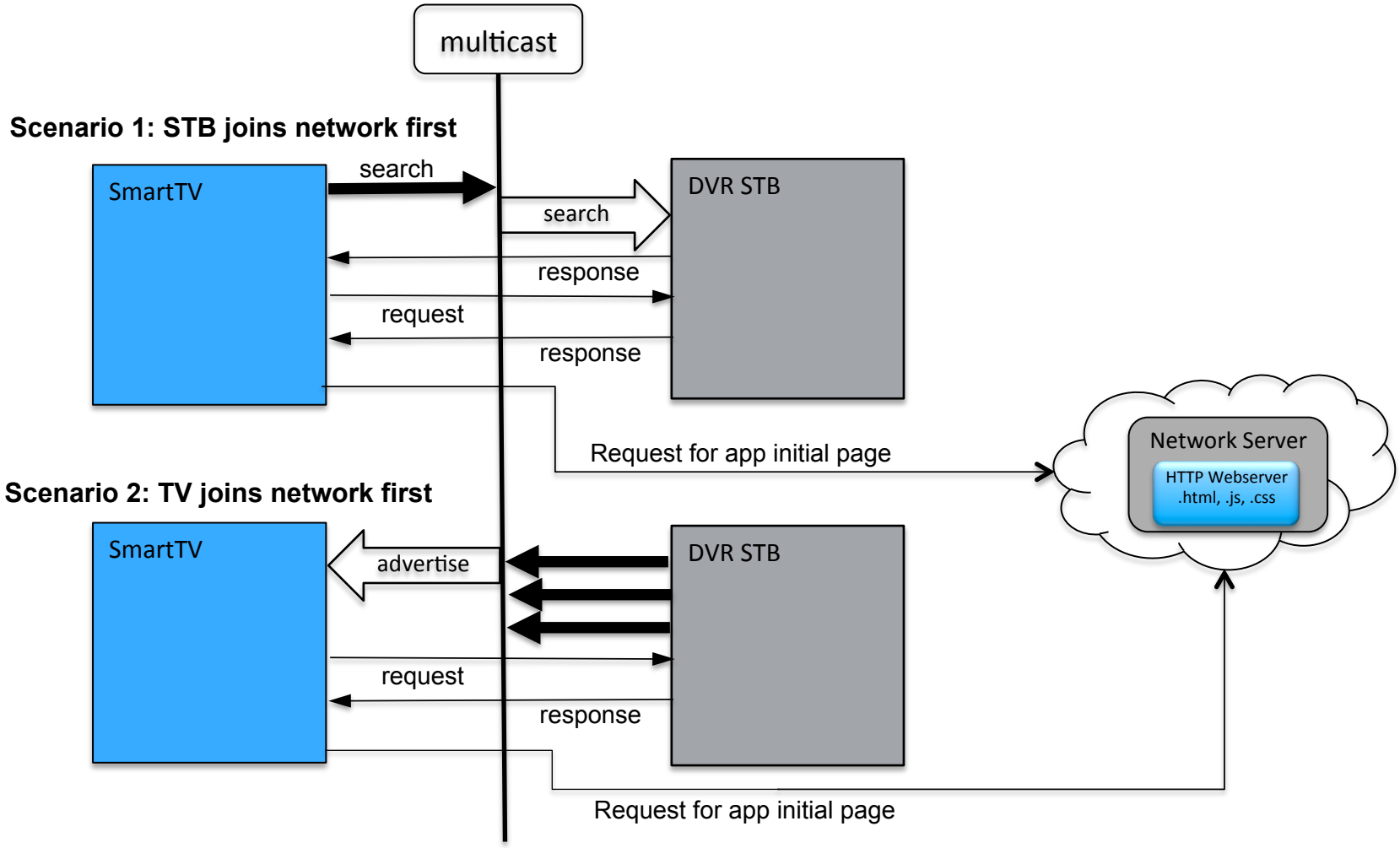
Samsung SmartTV

- The Samsung SmartTV provides a CEA-2014-A compatible web browser as the application environment.
- CEA-2014-A is based on XHTML and includes extensions for device discovery and A/V control.
- Samsung's Smart Hub allows application developed in HTML/CSS/Javascript to be loaded into the TV from Samsung's servers.
- Time Warner Cable has been working with Samsung to develop an application that allows access to DVR recordings over the home network, plus the ability to view On-Demand video via the DOCSIS network.
- The inclusion of web technologies on the Samsung SmartTV has allowed Time Warner Cable to use rapid iteration while developing the user interface.
- The user interface logic, graphics resources can be hosted on a server in our Network which gives us the ability to make updates quickly.
- Data is provided by web services that are hosted on the in-home DVR STB and in our Network.

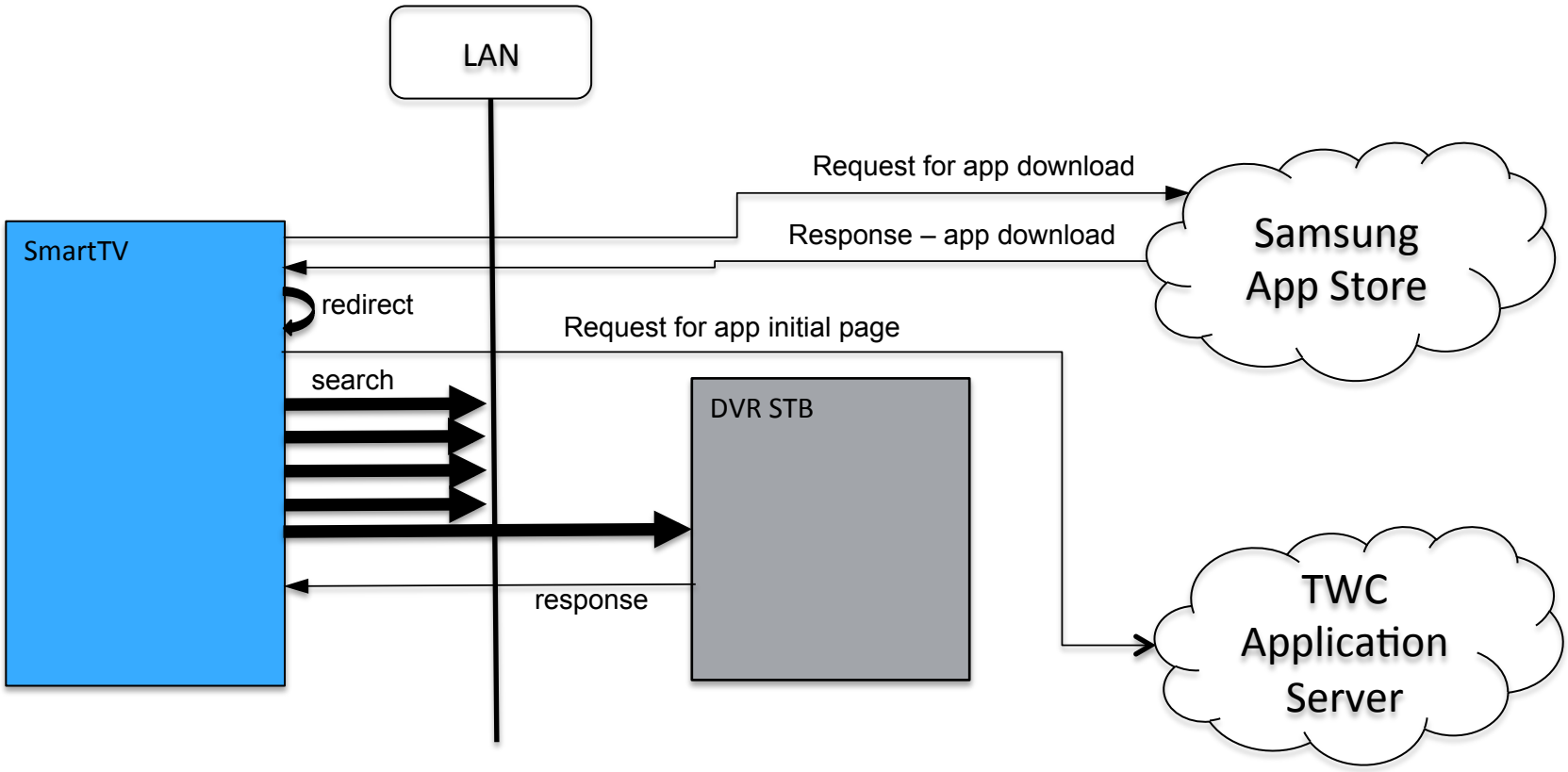
Architecture



Discovery - SSDP



Discovery – App Store



Conclusions

- The time for Web Technologies to be used for creating robust user experiences for CE devices and STBs in NOW!
- The flexibility and ease of development of network based user interfaces based on web technologies allows for rapid prototyping and deployment of many different user experiences.

Additional work is needed by the W3C to provide a complete environment for this type of UI development:

- **Discovery**: devices require the ability to discover application servers and applications need the ability to discover media and data sources.
- **Video**: TWC would like to encourage the W3C to continue the development of the video tag so that it can provide a generic interface to all video formats regardless of encoding, file format, protocols, or content protection.
- **Home Networking**: generic APIs to access devices and service on the home network will allow for the development of applications that will allow the seamless integration of devices in the home.