



DAVIC 1.5 Baseline 16

Applicability of DAVIC 1.5 Intranet Architecture to TV Anywhere and TV Anytime scenarios

Revision 5.0

Editors:

Tom Helmes
Frits Klok
15/04/99

NOTICE

Use of the technologies described in this specification may infringe patents, copyrights or intellectual property rights of DAVIC Members or non-members.

This DAVIC 1.5 Specification is subject to change without notice.

Neither DAVIC nor any of its Members accept any responsibility whatsoever for damages or liability, direct or consequential, which may result from use of this specification.

Baseline 16

© Digital Audio-Visual Council 1999.

Published by Digital Audio-Visual Council

Geneva, Switzerland

CONTENTS

<i>Introduction</i>	2
<i>The DAVIC 1.5 Intranet</i>	3
<i>The DAVIC 1.5 Intranet Support for TV Anytime and TV Anyplace Scenarios</i>	4
<i>DAVIC 1.5 Intranet Limitations</i>	5
<i>Items Not Yet Completed</i>	6

Introduction

The DAVIC Intranet is being designed to alleviate some of the restrictions that are valid in the current Internet. Coherence in terms of dimensioning, resource allocation, prioritization and commercial models is something that is desirable but not found in the Internet today. Examples of this added value of the DAVIC Intranet are e.g. QoS support inside and between DAVIC Intranets, multicast distribution and replication policy, security and management functions. The DAVIC Intranet should enable network providers, manufacturers, service operators and content providers with a way of delivering services that are predictable, manageable and economically feasible.

This document describes what the current DAVIC 1.5 Intranet system looks like, what features it has, what the limitations are and how it can be used to support the 'TV Anywhere' and 'TV Anytime' scenarios that have been defined for DAVIC 1.5. It will identify work items for future versions of the DAVIC specification.

The DAVIC 1.5 Intranet

The DAVIC 1.5 Intranet architectural model is shown in figure 1. It shows the relations between the different functional elements that are being used in the DAVIC 1.5 Intranet System. The identified functional elements for DAVIC 1.5 are a DAVIC Intranet server, a DAVIC Intranet client and a local storage server. These elements are connected through the DAVIC Intranet (this includes the home network).

The DAVIC Intranet server is a device that is capable of streaming 'real-time' audiovisual material to a client or a

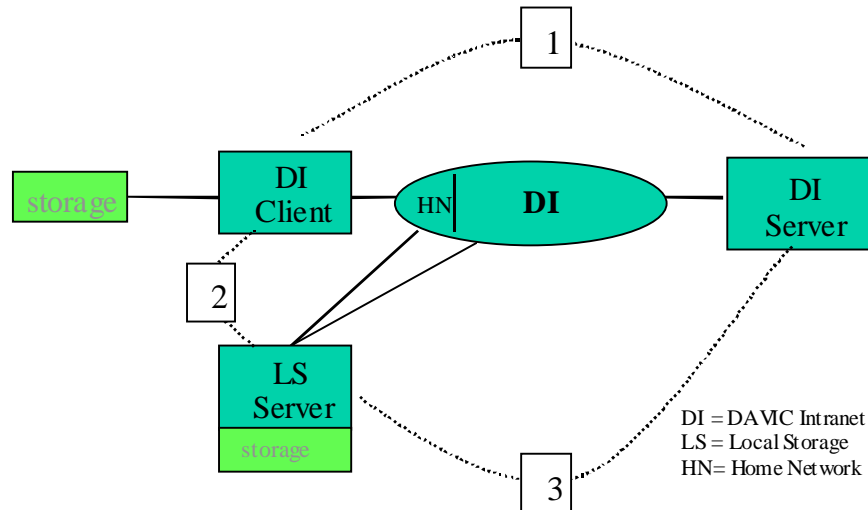


Figure 1 The DAVIC 1.5 Intranet architecture

local storage server. The DAVIC Intranet client is able to decode and display this audiovisual stream in real time. The client may also instruct the local server to record a real-time or non-real time stream coming from the DAVIC Intranet server. It may also ask the local storage server to play any audiovisual streams that are on the disk. The relationships between these entities are being indicated by the numbered dotted lines.

The DAVIC 1.5 architectural model is a simplified version of the DAVIC Intranet model in which multiple DAVIC Intranets can be interconnected and other internetworking may be taking place.

The DAVIC 1.5 Intranet Support for TV Anytime and TV Anyplace Scenarios

The [DAVIC 1.5 Intranet](#) architecture has a number of features. It is build upon a 'normal IP network architecture' that is used in the Internet today. This also means that the DAVIC Intranet client is supposed to support web-browsing. Other application specific protocols are not yet defined.

Some elements and protocols have been added to the standard DAVIC Intranet to allow for the support of TV Anytime and TV Anywhere scenarios. The added elements relate to network protocols and control protocols, not to higher layer protocols like coding mechanisms, APIs or application protocols which are specified elsewhere in DAVIC documentation.

The following application scenarios are currently supported (with the limitations discussed later in this document):

TV Anywhere: Streaming of audiovisual material to a DAVIC Intranet client over the DAVIC Intranet. If Quality of Service tools (QoS) are used in the DAVIC Intranet, then 'television like' quality audiovisual material can be supported with these tools. If QoS tools are not used, probably only lower quality material can be transmitted. DAVIC Intranet clients can have their 'own' streams or share a broadcast stream destined for multiple DAVIC Intranet clients.

TV Anytime: A number of tools is provided to support the TV anytime scenario. For DAVIC 1.5, at least the following scenarios are supported:

Broadcast capture (The digital VCR): The DAVIC Intranet tools will enable the user to instruct it's local storage device (either in the home or in the network) like today's analog VCR to record or play programs.

Dynamic viewing: The DAVIC Intranet client can instruct the local storage server to record a streaming 'live feed'. Directly after this command the user can instruct the storage server and play back this captured stream in real time. This enables users to pause, stop and rewind 'television programming'.

Segment jumping: The DAVIC Intranet client can instruct the local storage device to jump to a certain part of a stored stream. This enables 'segment jumping' from a protocol standpoint. However, things like metadata has to be provided for this application.

To enable these applications the DAVIC Intranet architecture supports:

- The (optional) use of RSVP for reservation of resources in the DAVIC Intranet,
- The mandated use of IP Multicasting tools,
- The mandated use of real-time transport protocols,
- The mandated use of control protocols to enable local storage of audiovisual streams
- The dynamic flows & protocol mappings to support the TV anywhere/time applications

So only an IP-based network that supports the mandated protocols and dynamic flows mentioned previously, can be called a DAVIC Intranet. The current Internet as a whole does not support all of these capabilities.

DAVIC 1.5 Intranet Limitations

There are some limitations as far as the TV Anytime and TV Anywhere Application Scenarios are concerned.

TV Anywhere: Traditional TV-like quality can only be supported on a DAVIC QoS-enabled Intranet. Since this is only a one-network domain, it will not be a worldwide network. This means that 'real' TV Anywhere is only supported as far as the one domain network reaches. However, some DAVIC services may be reached via a non-QoS Internet connection.

TV Anytime: The Video File Transfer support is still under discussion for inclusion in DAVIC 1.5 Intranet architecture. Other services like content customization are not yet supported.

Due to the state of some protocols in the IETF and the progress made in DAVIC up till now, some limitations have to be taken into consideration when trying to implement [the DAVIC 1.5 Intranet](#).

Current limitations are:

- [The DAVIC 1.5 Intranet](#) architecture is limited to one administrative domain. This means that no internetworking beyond the normal Internet practices is specified at the moment.
- Since the use of RSVP is not mandated, the jitter removal protocols specified in the DAVIC Intranet design may not support the transport of high quality audiovisual content.
- The use of RSVP should be aligned with the IETF recommendations in RFC 2208.
- This version of the DAVIC Intranet Specification does not include the technical specification for UPI to URL resolution. Therefore, the metadata aspects specified in the TV Anywhere & TV Anytime scenarios (which is based on UPI) cannot be utilized with a DAVIC Intranet Platform. The DAVIC Intranet mechanism for program identification utilizes URLs contained in SDP obtained via HTTP.
- It should be noted that there may be duplication between the DAVIC metadata and the SDP description. Implementors should be cautious that the data is consistent.
- If RSVP is supported in the network, then the clients and servers need to be pre-configured to recognize this.
 - It should be noted that if RSVP is used for quality of service, T-Spec parameters should be derived from the SDP and/or other information (e.g., MPU Path Discovery). The details of this have not yet been defined.
- DAVIC Intranet multicast addresses need to be provided by the network administrator, either manually or by other means, in order to avoid conflicts.
- The control of the local storage device is not very extensive. For example, there is no defined protocol yet for local storage control of "pull" video file transfer.

Items Not Yet Completed

To enhance the current DAVIC 1.5 Intranet design, several items have been identified as necessary future work items. These include:

- Home networks, what functions and protocols should reside in the home? Remote management issues. Evolutionary path from simple systems to more advanced.
- Protocols for local storage control and management to support APIs. (e.g. caching and discovery)
- Multiple DAVIC Intranet implementations with details for protocol usage and supported functions (e.g. enhanced QoS, RTCP)
- The use of IPv6
- Security
- Name to location resolution protocols to support TVAnyTW
- More detailed architecture diagrams / system reference model
- Gateways in the home from an MPEG-2 Network to the DAVIC Intranet
- Protocols for the control of local servers by DAVIC Intranet servers
- Scalable transport of audiovisual material (MPEG-2, MPEG-4?)
- Distributed local storage server architectures
- Use of advanced session control protocols

Conferencing