

Overview Of Calendaring And Scheduling Standards

Open Internet standards are necessary for calendaring and scheduling (C&S) applications to interoperate. This paper identifies and describes the standards required for open calendaring and scheduling, describes the current status of C&S standards, and discusses Netscape's adoption of and participation in standards efforts.

This paper contains the following sections:

- The Need for Calendaring and Scheduling Standards
- Benefits of Calendaring and Scheduling Standards
- Proposed Calendaring and Scheduling Standards
- Evaluating a Calendaring and Scheduling Solution
- Summary
- Suggested Reading

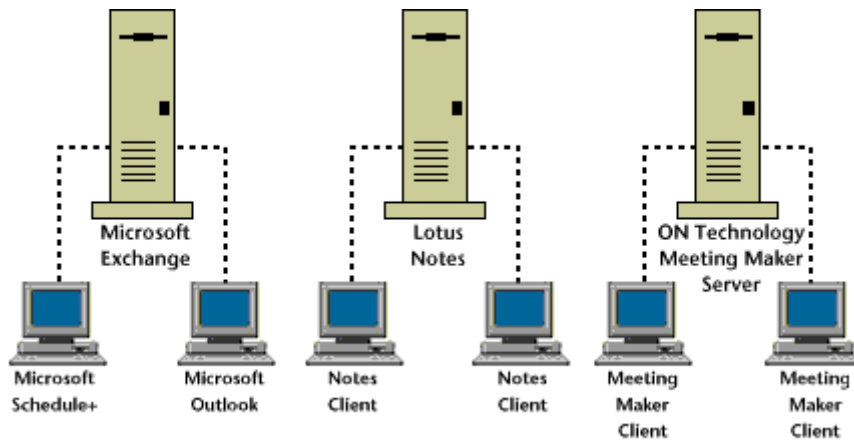
The Need For Calendaring And Scheduling Standards

Standards for C&S applications have yet to be defined, so current C&S applications are by definition proprietary. Each application uses its own proprietary communication protocol, making it impossible for calendar applications to interoperate without gateways.

The lack of C&S standards has resulted in the following interoperability problems:

- Users can't choose their own calendaring and scheduling application. Today users can't choose a personal C&S application and maintain interoperability with other users in an organization. For example, if an organization selects On Technology's Meeting Maker, all users in the company must use the Meeting Maker client. Anyone who prefers a different C&S application - for example, Starfish Software's Sidekick 97 or Lotus Organizer - is forced to use two different C&S clients. Typically, users must manually copy information from one application to another.
- Users on one calendaring and scheduling system can't communicate with users on another. Currently, separate organizations typically cannot schedule meetings with each other. For example, if an organization has one set of users with Microsoft Schedule+ and Exchange and another set with On Technology's Meeting Maker, the users have no convenient way of communicating with each other. They must go outside the C&S system and do their scheduling via email or telephone. This is often true even if two organizations are using the same C&S solution. Because most C&S systems available today were designed for use behind a corporate firewall on a trusted network, they are not suitable for Internet calendaring and scheduling.
- Users can't easily exchange information between their electronic organizers and their organization's calendaring and scheduling system. Standards-based mechanisms for exchanging C&S information haven't existed until very recently. The lack of standards has forced C&S vendors to write specific import and export utilities for each electronic organizer. As a result, many PC-based calendaring products do not interoperate well with other products or electronic organizers.

Without Standards, Users With Different C&S Applications Are Disconnected



To summarize:

- Users within a C&S system are not free to choose their own personal desktop application or handheld device.
- Users of one C&S application cannot easily schedule meetings and interoperate with users of another system.
- It's difficult and tedious for users to share information from one application to another.

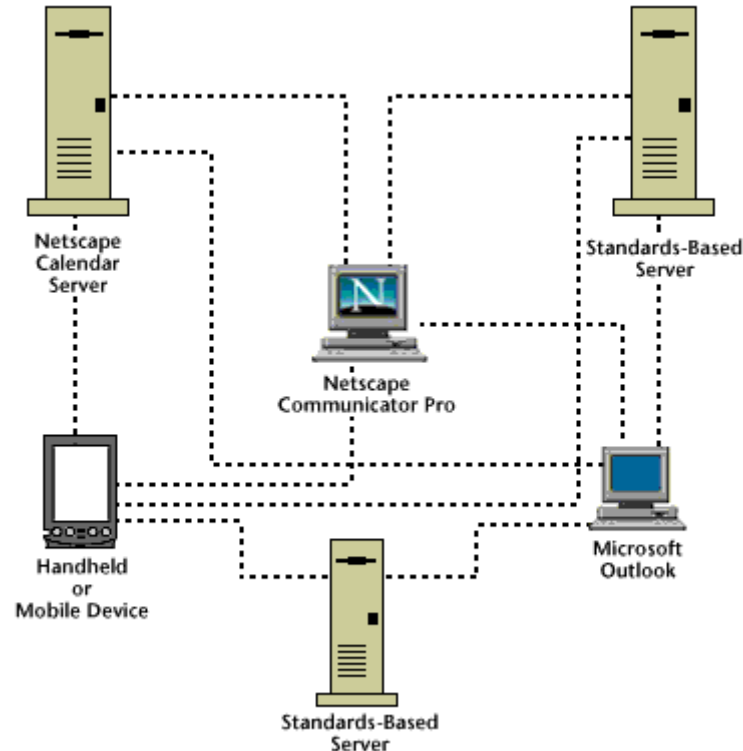
Benefits of Calendaring and Scheduling Standards

One way to achieve interoperability among C&S applications would be for each vendor to provide gateways or conversion tools. But because the C&S market is highly fragmented it would be difficult, if not impossible, for one vendor to support every other C&S application. A vendor who did want to build gateways would likely have to reverse-engineer many of the protocols since many of them aren't published and few SDKs or APIs are available.

Open C&S standards provide a better solution. Vendors supporting open standards gain interoperability with any other vendor who supports open standards. Open standards-based C&S products let users

- interoperate and schedule with other open standards-based C&S systems
- choose the calendaring client they would like to use regardless of their calendaring server software
- integrate desktop applications with each other and with handheld or portable devices

With Open Standards, Different C&S Applications Can Interoperate



Unfortunately, open C&S standards are still in development.

In July 1996 Netscape hosted a C&S summit in Mountain View, California, that was attended by major C&S vendors, such as Campbell Software, Lotus, and Microsoft. The summit attendees agreed to follow the Internet Engineering Task Force (IETF) process for developing protocols; soon afterward the IETF Calendaring and Scheduling Working Group was formed.

Proposed Calendaring and Scheduling Standards

The following standards are currently under discussion in the IETF or have been recently approved:

- calendaring data interchange standard
- calendaring interoperability protocol
- calendar access protocol

CALENDARING DATA INTERCHANGE STANDARD

A data interchange standard describes the data exchange format for communication. For example, a calendaring data interchange standard describes how to record the date, time, and location of a meeting. Calendaring data interchange standards allow C&S applications to communicate with each other once they establish a communication link. The communication link can be provided through a separate protocol or a desktop operating system. With a standard calendaring data interchange format, vendors can implement the following:

- Drag-and-drop functionality from one calendaring application to another. For example, a user could drag a meeting from the Netscape Calendar client into Starfish Sidekick.
- Drag-and-drop functionality between C&S and other applications. For example, users could drag training classes into their calendars for a corporate intranet training web site.

- Integration between desktop and handheld devices. Calendaring data interchange standards integrate desktop and handheld devices, making it easy for different applications to exchange calendaring data by supporting one data interchange format.

Versit, an industry consortium creating open specifications for the convergence of communications and computing, has developed two data interchange formats, vCard and vCalendar. The vCard format describes personal information typically found on a business card - for example, name, address, telephone number, and email address. The vCalendar format describes calendar and task information such as the subject of a meeting, the list of invitees, and date and time.

The IETF Calendaring and Scheduling Working Group has defined a data interchange format, iCalendar, it calls core object specification.

CALENDARING INTEROPERABILITY PROTOCOL

A calendaring interoperability protocol describes how two different calendaring servers or systems communicate. By implementing an interoperability protocol and a data interchange format, calendaring solutions from two different vendors can communicate. This provides the following functionality:

- Users can find busy-time for users on another C&S system.
- Users can extend invitations to users on another C&S system.
- Users can respond to invitations from users on another C&S system.

The IETF Calendaring and Scheduling Working Group has defined a set of calendar interoperability protocol (iTIP, iMIP, and iRIP).

CALENDAR ACCESS PROTOCOL

A calendar access protocol standard allows clients and servers from different vendors to interoperate. Analogous messaging standards are Post Office Protocol version 3 (POP3) and Internet Message Access Protocol version 4 (IMAP4) for messaging client-server communication. With a client-server communication protocol standard and a data interchange format, the following are possible:

- An enterprise could standardize on a calendar server and client, but individual users would be free to choose their own client. For example, advanced users might choose a complex, sophisticated tool from one vendor, while less sophisticated users might choose a simple application. Users of handheld or mobile devices might choose yet another a tool.
- Users could have multiple calendar applications sharing the same calendar data. For example, users might have one application on their desktop computer, one application on their handheld device, and one application on their notebook computer.
- Developers could use the open protocol to build calendaring applications that work with many vendors' systems. It would not be necessary to learn a vendor's proprietary API to extend C&S applications.

The IETF Calendaring and Scheduling Working Group is currently defining a standard for a calendar access protocol (CAP). ICAP, the Internet Calendar Access Protocol, has also been submitted for consideration (including ICAP by Peter O'Leary of Amplitude Software).

RELATED DIRECTORY AND MESSAGING STANDARDS

An open C&S system must interoperate with open directory and messaging systems. But a vendor who supports open C&S standards can still lock users into its product through proprietary directory and messaging services. Therefore the following are required for truly open C&S solutions:

- Integration with Lightweight Directory Access Protocol (LDAP). Directories are required for C&S systems so users can identify other users as well as determine the location of C&S data for busy-time searches or calendar viewing (with proper permission). Integration with directory services via LDAP also lets applications share user and group data. With shared groups, a mailing list of users can be

used for scheduling meetings. With a shared directory, administrators can manage users through the directory, eliminating redundant data and reducing administrative cost and effort.

- Integration with messaging via Simple Mail Transfer Protocol (SMTP), the Internet standard for electronic messaging. Users frequently want to receive meeting notifications or updates by email. By supporting Internet mail standards, users can choose any messaging system without being locked into one vendor's product.

Netscape Calendar Server 1.0 and Netscape Communicator Professional Edition already support SMTP for Internet mail and LDAP for directory access. Netscape Calendar Server 2.0 will support LDAP for directory access. Netscape SuiteSpot servers provide native support of groupware-related open standards including Network News Transport Protocol (NNTP) and SMTP.

Evaluating a Calendaring and Scheduling Solution

The following questions are important to consider in evaluating C&S solutions:

- Does the vendor provide native, complete support for open standards in all its products, or does the vendor use proprietary protocols that can lock users in?
- Does the vendor currently support vCalendar and vCard?
- Does the vendor use LDAP for directory access?
- Does the vendor support SMTP for messaging integration, or does the vendor rely on a proprietary messaging protocol with add-on gateways for SMTP?
- Has the vendor announced a commitment to support the standards defined by the IETF Calendaring and Scheduling Working Group?

The chart below summarizes Netscape's support for relevant C&S protocols and compares it to that of other C&S vendors.

Standard	Status	Netscape Support
Calendaring data interchange format	vCard and vCalendar have been published by Versit. iCalendar, a derivative of vCalendar, is currently being finalized by the IETF C&S Working Group.	Communicator supports vCard; Communicator Professional Edition adds vCalendar support. Future Netscape products will add iCalendar support when defined by the IETF C&S Working Group.
Calendaring interoperability protocol	iTIP, iMIP, and iRIP are currently under consideration by the IETF C & S Working Group.	Future Netscape products will support the interoperability protocol defined by the IETF C&S Working Group.
Calendar access protocol	The IETF C&S Working Group plans to define a CAP once data interchange and interoperability protocols have been defined.	Future Netscape products will support the C&S access protocol defined by the IETF C&S Working Group.
Directory access protocol	LDAP	LDAP is currently supported in Netscape Directory Server. Netscape Calendar Server 2.0 expects to add native LDAP support for directory access.
Messaging protocol	SMTP	Calendar Server 1.0 supports SMTP for email integration.

Summary

The definition of open standards is the most important step toward delivering C&S interoperability. C&S standards let users freely choose whatever application suits their needs and allows them to interoperate with other standards-based products.

Netscape hosted a C&S summit that resulted in the formation of an IETF Calendaring and Scheduling Working Group. Netscape is actively participating in the standards process and will adopt the standards defined by the IETF Calendaring and Scheduling Working Group. The working group is currently defining three standards:

- a calendaring data interchange format or core object specification based on vCalendar and called iCalendar
- a calendaring interoperability protocol
- a calendar access protocol

Several major C&S vendors support vCard and vCalendar. Netscape Communicator Professional Edition supports both. Future Netscape C&S products will support the standards for data interchange, calendar interoperability, and calendar access defined by the working group.

Finally, to build a truly open C&S system it is also necessary to support open directory and messaging standards. Calendar Server 2.0 and Communicator Professional Edition support LDAP, the Internet directory protocol, and SMTP, the Internet email protocol.

With Calendar Server and Communicator Professional Edition, Netscape continues to deliver the premier standards-based calendaring and scheduling solution.