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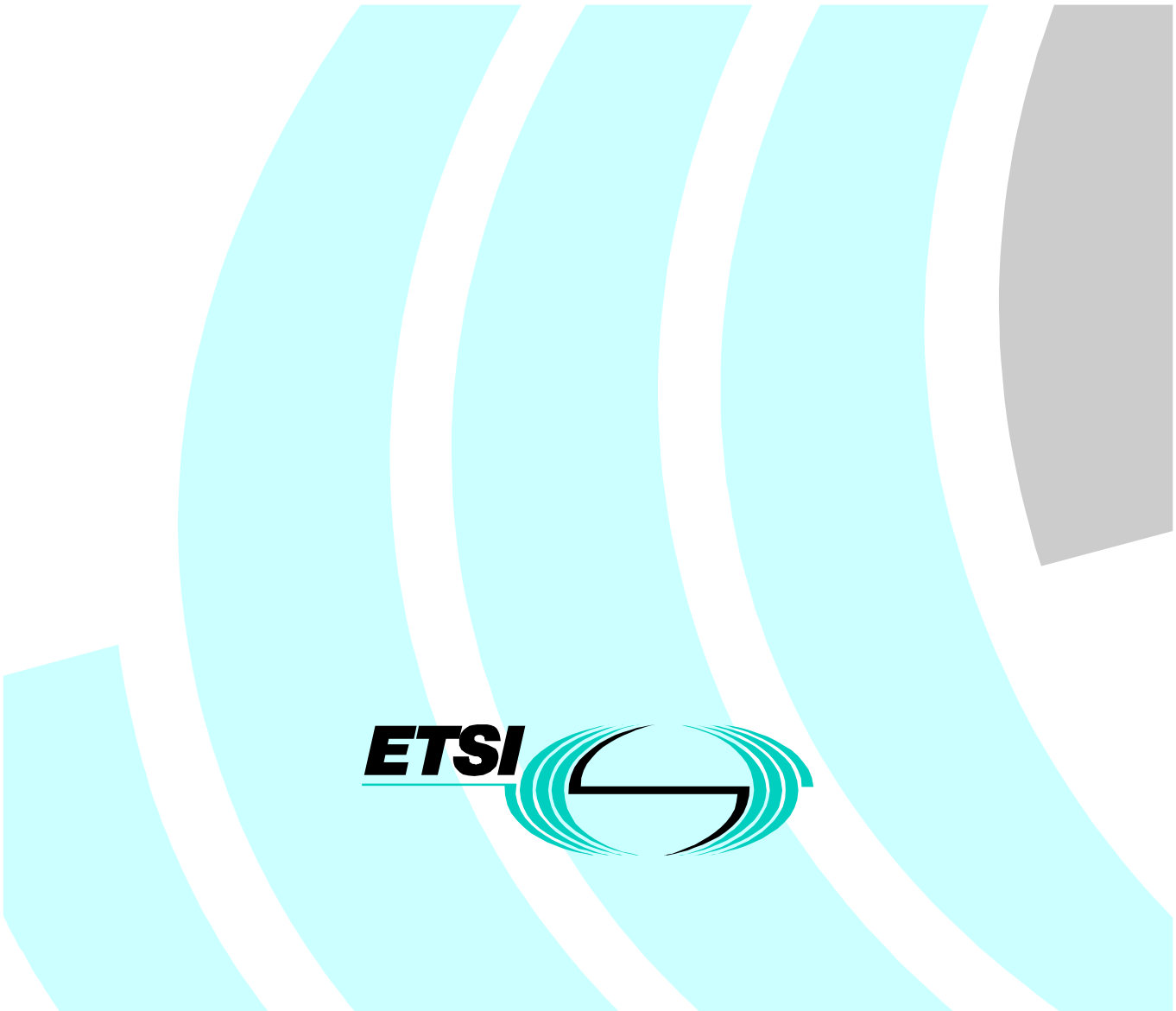
Technical Report

Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Verification Demonstration and Interoperability (VDI) activities; Version 3



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Foreword

This Technical Report (TR) has been produced by ETSI Project Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON).

1 Scope

The present document introduces the activities of the Verification-Demonstration-Interoperability (VDI) working group of TIPHON which organizes interoperability events and provides remote testing facilities (Implementers Net).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] TS 101 335: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON); Test specifications".

[2] ITU-T Recommendation H.323: "Packet based multimedia communications systems".

[3] ITU-T Recommendation H.245: "Control protocol for multimedia communication".

[4] ITU-T Recommendation H.225.0: "Call signalling protocols and media stream packetization for packet-based multimedia communication systems".

3 Abbreviations

For the purposes of the present document the following abbreviations apply:

BRI	Basic Rate Interface
CoIP	Conferencing over IP Activity Group of IMTC
IMTC	International Multimedia Teleconferencing Consortium
INOW!	Interoperability NOW, Activity Group of IMTC
ISDN	Integrated Services Digital Network
LAN	Local Area Network
NDA	Non-Disclosure Agreement
PBX	Private Branch eXchange
PRI	Primary Rate Interface
PSTN	Public Switched Telephone Network
STF	Specialist Task Force
VDI	Verification-Demonstration-Interoperability
VIMP	Virtual Interop Meeting Place
WG	Working Group

4 Interoperability Testing

4.1 Purpose/ Objectives

The purpose of interoperability testing is to verify the TIPHON specifications and interoperability of different implementations. These tests can either take place in a single room, “classic" or “face-to-face" Interoperability Events, or can be spread over the whole world using remote connectivity, then they are called remote Interop events.

4.2 Testing

Testing will verify all TIPHON scenarios (that is, PC to PC, PC to Phone, Phone to PC, and Phone to Phone). Testing will attempt to completely demonstrate and debug these services, rather than just concentrate on the specific protocol elements that are required.

4.3 Privacy

The result of the tests will not be in any case available outside TIPHON membership, nor may it be used in any case under any situation to promote some products as being "more" TIPHON compliant than others, or for any other purpose other than the verification and debugging of the TIPHON specifications.

There will be no formal kind of NDA to be filled out, but there is always a kind of gentleman’s agreement not to disclose any individual results.

Documents that request changes to the TIPHON specifications as a result of the Interoperability events will not directly reference the vendor that found the fault.

4.4 Responsible WG

Interoperability events will be operated under the responsibility of WG6, with support from the relevant protocol generating and specifying WGs (i.e. WG3, WG4, and WG5).

4.5 Test Procedures

Test specifications of all TIPHON scenarios can be found in TS 101 335 [1].

4.6 Test Scoring

In tests which are scored, score sheets are distributed based on TS 101 335 [1].

4.7 Participation

4.7.1 Joint events

TIPHON interoperability events are in general organized jointly with IMTC CoIP.

4.7.2 Who can participate

Participation is open to ETSI members, ETSI associate members, IMTC members, and companies in the application process to become a member of ETSI or IMTC. Participants need to have products or services available for testing with other companies. Companies simply wanting to observe the testing will not be allowed to attend the event.

5 Interoperability Events

Interoperability events can take place as face-to-face events, or as remote events.

5.1 Face-to-face Interoperability Events

The classical way to test interoperability is to meet in a room and connect multiple systems together.

5.1.1 Organization

Interoperability events are in general organized together with the CoIP (Conferencing over IP) Activity Group of IMTC (International Multimedia Teleconferencing Consortium).

Annex 1, "Guidelines for the organization of interoperability events", summarizes the experience gained from multiple interoperability events and may prove useful for future organizers of Interoperability events.

5.1.2 Registration

Prior to any Interop the participants have to register. To optimize this process and to easily provide detailed information to the other participants ETSI has installed the VIMP. More details are described in clause 7 of the present document.

5.1.3 Scheduling

Scheduling is one of the most difficult aspects of Interop Events. As a consensus we can state that the participants prefer 65% of the time as ad hoc, self scheduled tests and 35% of the time as scheduled by the organizers.

Scheduled tests in face-to-face interoperability events are intended to test the interoperability of a large number of participants in a minimum of time. Thus the timeslots are pretty short and there is no time for the companies to debug. Extensive analyses and debugging can take place in the ad-hoc test time after the scheduled tests.

5.1.4 Frequency

Here is some feedback collected at two post Interoperability Events in Boston and Sophia Antipolis.

How many Interop Event should there be per year?

	4-99 Boston	**6-99 Sophia Antipolis**
1 per year	0%	2 %
2 per year	18 %	18 %
3 per year	30 %	45 %
4 per year	49 %	30 %
6 per year	3 %	5 %
Average	**3,4**	**3,2**

5.2 Remote Interoperability Events

Remote Interoperability Events provide companies the opportunity to test interoperability in their own labs without buying other companies equipment. They can interconnect to other parties via the public Internet or the ETSI ISDN router.

5.2.1 Organization

The organization of a remote interoperability event is different from a face to face event. There is no need to arrange a room and prepare accommodation, but in order to organize an effective event the information for the participants have to be much more detailed and precise, as communication is much more complicated and solving simple problems may be very time-consuming.

5.2.2 Registration

Prior to any Interop the participants have to register. To optimize this process and to provide detailed information to the other participants in any effective way, ETSI has installed the VIMP. More details are described in clause 7 of the present document.

The information provided about other participants equipment is very important for remote interoperability events, as it is much more complicated to collect details at a later stage.

These details include:

- Time of day the contact person is present in the company and able to do testing;
- Ability to test using the pubic internet;
- Ability to test using the TIPHON Interop Router;
- IP-Address of device (if known and important for test);
- Alias the Endpoint is going to register with;
- Gateway Prefix, the Gateway is going to register with, or Endpoint Alias;
- Number an Endpoint has to dial to reach a telephone connected to the Gateway.

5.2.3 Communication

The communication is simple if you are sitting together in one room. If you test remotely, you must have a telephone conference or a simple chat tool to communicate the progress of the test. A chat tool also allowS the co-ordinator to be informed about the progress of a test.

5.2.4 Time

As TIPHON is a world-wide project we have different time zones for the participating companies. It is not complicated to calculate the actual time in another parts of the world but causes sometimes confusion. To simplify this, TIPHON should use a common time-base to schedule tests. UTC or the InternetTime can be used as a common time.

5.2.5 Scheduling

Scheduling is one of the most difficult aspects of Interop Events. As a consensus we can state that the participants prefer 65% of the time as ad hoc, self scheduled tests and 35% of the time as scheduled by the organizers.

Scheduling of a remote interoperability event has to take some specialities into account:

A test can either use the public internet or the Interop router but this can not be mixed due to routing reasons.

- Companies have to be available at the same time;
- The time for each configuration has to be at least 1-2 hours long, to give participants time for debugging;
- Schedules including all relevant data have to be delivered to the participants;
- The participants have to check, if they can operate with the parameters of the others like Endpoint Alias or Gateway Prefix if not they have to announce this.

6 Implementers Net

6.1 Purpose/Objectives

A new framework called Implementers Net is being created under the umbrella of WG6 to support Interoperability testing for TIPHON equipment manufacturers only. This framework is not be used for demonstration or trial, and access will be tightly controlled. The Implementers Net is currently being set up and replaces the TIPHON-Net.

6.2 Architecture

The architecture contains a central ISDN/PSTN router, where vendors can dial up with either an ITU-T Recommendation H.323 [2] terminal, equipped with an ISDN card, or an ISDN router.

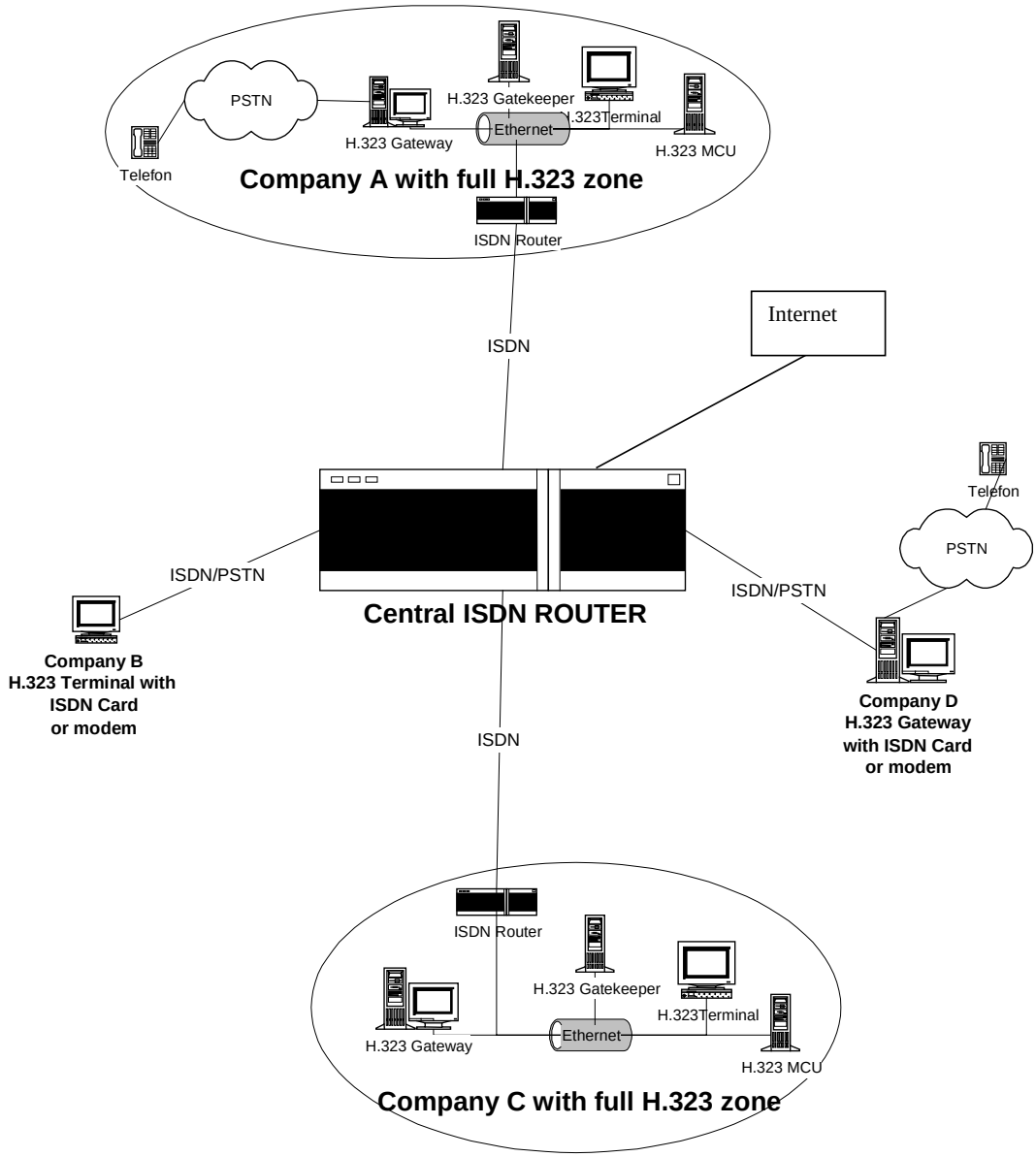

Figure 1: Implementer's Net Architecture

6.3 Procedures

The Implementers Net is used for ad-hoc testing (i.e., it is up to the individual companies to find partners) and for "Remote Interoperability Events." The "Virtual Interoperability Meeting Place" (see next chapter) will be used to schedule tests and find like-minded partners.

6.4 Requirements

Each participant needs either an ITU-T Recommendation H.323 [2] terminal, equipped with an ISDN card, or an ISDN router connected via LAN to the local ITU-T Recommendation H.323 [2] testbed or alternatively the public internet can be used.

6.5 Technical details of the Dial up ISDN router

The ISDN router supports 30 concurrent ISDN or analogous connections.

The router is configured with incoming lines only (30). Phone costs for dialing in are paid by the callers.

6.6 Administration of the ISDN router

The ISDN router is administered by the STF 114 or ETSI network administration.

7 The Virtual Interoperability Meeting Place (VIMP)

7.1 Purpose

The VIMP is the central organizational element for Interoperability events and the use of the Implementers Net.

The VIMP contains a database of the companies and TIPHON compliant products. Before participating in any interoperability event or using the Implementers Net, each company has to register a primary contact and its equipment with the VIMP. This registration can either be specific for the upcoming event or continuous. The collected data enables all implementers to look for partners for ad-hoc tests during or after the interoperability events.

The collected information is the basis for the organizer of the Interoperability event to schedule the tests and for the other participants of the event to find adequate partners for ad-hoc testing.

7.2 Structure

The virtual meeting place contains form fields where engineers enter all the necessary information such as:

- equipment (endpoint, gateway, gatekeeper, MCU);
- codecs supported;
- which version of H.xxx (ITU-T Recommendation H.323 [2], ITU-T Recommendation H.245 [3], ITU-T Recommendation H.225.0 [4], …) they implement;
- which features within a version are supported (Fast connect, ITU-T Recommendation H.245 [3] tunnelling, Gatekeeper routed signalling, Direct routed signalling, …);
- what they would like to test;
- when they would like to test;
- Names & addresses of engineers;
- test scenarios with scoring guide;
- availability for companies to enter anonymously results of their tests.

The homepage is publicly available and has a branch to a member section. The member section is password-protected and only accessible to test engineers, ETSI-TIPHON STF 114 and the IMTC CoIP chair.

7.3 Organization

The VIMP is administered by the STF 114 and ETSI network administration. The STF 114 and IMTC CoIP will play a pro-active role in managing and organizing remote tests (ad-hoc remote tests; remote interoperability events).

8 Implementers mailing list

8.1 Purpose of TIPHON_Implementers

The purpose of this Mailing List is to announce interoperability tests and discuss technical details in a private and secure way. Access is controlled by the ETSI STF 114, WG6 chairman and IMTC CoIP chairmen, and only equipment manufacturers will be allowed to join. The Mailing List will be organized and administered by the STF 114.

8.2 How to join the TIPHON_Implementers List

1) You send a subscribe request in the body part (not the subject) of a message to the mailing list manager **LISTSERV@LIST.ETSI.FR**.

   - SUBSCRIBE TIPHON_Implementers (firstname surname);

   - Two separate words are required for *firstname* and *surname*.

2) The mailing list manager may check that it can reach your e-mail address by sending you a message which you will have to confirm. If sent, the message will contain a line with the word "OK" followed by a code, e.g. **OK *sbc4na***.

Put that line in the body (not the subject) of a message and send it to LISTSERV@LIST.ETSI.FR.

3) The subscription request will be sent to the list owner (STF 114) who will decide, in agreement with the WG6 chairman and IMTC CoIP chairmen, if the request will be approved or not.

4) The list will confirm that you have been successfully added by sending you a file with information on the list and some helpful hints. Keep this carefully. You may need it to change your settings or to leave the list.

Annex A (informative): Guidelines for the Organization of Interoperability Events

The following is a collection of experiences and guidelines, resulting from two interoperability events, which may prove useful for the organization of future interoperability events.

A.1 Responsibilities

- There needs to be one person with the overall responsibility of the event.
- Some tasks will be delegated. It has to be clear who is responsible for what, e.g. setting up the network, making arrangements with the hotel, etc.

A.2 Timing

- Make sure that the location where the interoperability event takes place is booked early enough. Hotels may not be able to have e.g. a ballroom available for an entire week unless reserved early enough.
- Inform participants early enough when the interoperability event is to take place (2-3 months).

A.3 How to register

Registration should make extensive use of the VIMP.

A.4 Guest rooms in hotel

Send list of hotels with the event kit, or, if event takes place in a hotel, make arrangements with hotel to reserve rooms for the event.

A.5 Deadline for registration

Make it about 3 weeks in advance. Be prepared that there will always be registrations coming in after the deadline.

A.6 Rental of Equipment

Companies should and do rent monitors. At the Sophia and Boston interoperability event, about 20-30 monitors had been rented. Arrange special deal with a local rental company. It is the responsibility of the companies to contact the rental place.

A.7 Shipping of equipment

About 20% of companies will ship big crates (up to 2m x 2m) with their equipment; others have all they need on their laptop. Equipment needs to be shipped off early enough (2/3 weeks), but shipping companies are pretty good in making sure that the equipment arrives on time. Shipping is the responsibility of the companies. Customs shouldn’t be a problem either, but expect a couple of phone calls from an airport on what to do with a particular shipment.

A.8 Facilities

- **Location:** often in hotels. Entire network has to be built up from scratch. Rooms may not be available until the event actually starts, or there may be additional costs for renting it. The test facility should be very close to hotels and restaurants.
- **Test room:** Each participant should have at least a desk space of 1 m x 1 m by default. The test room has to be secured and available 24 hours per day. The cabling should be arranged in a secured way to avoid damage of equipment.
- **Secured Storage Room:** to store anything safely on-site, to avoid transportation to the hotel. To store boxes waiting for rental return or shipping. For instance, a locker could be a nice feature.
- **Safe shipping and Rental Facilities:** especially at the beginning and at the end of the event, for delivering and returning of rental equipment. A receipt from the rental company is required when returning back the equipment.
- **Space**: in Boston, there was a 116 ft x 53 ft = 6 150 square feet (about 35 m x 16 m = 560 m2) ballroom in a hotel. This was a lot and no problem to host about 30 companies with 80+ people.

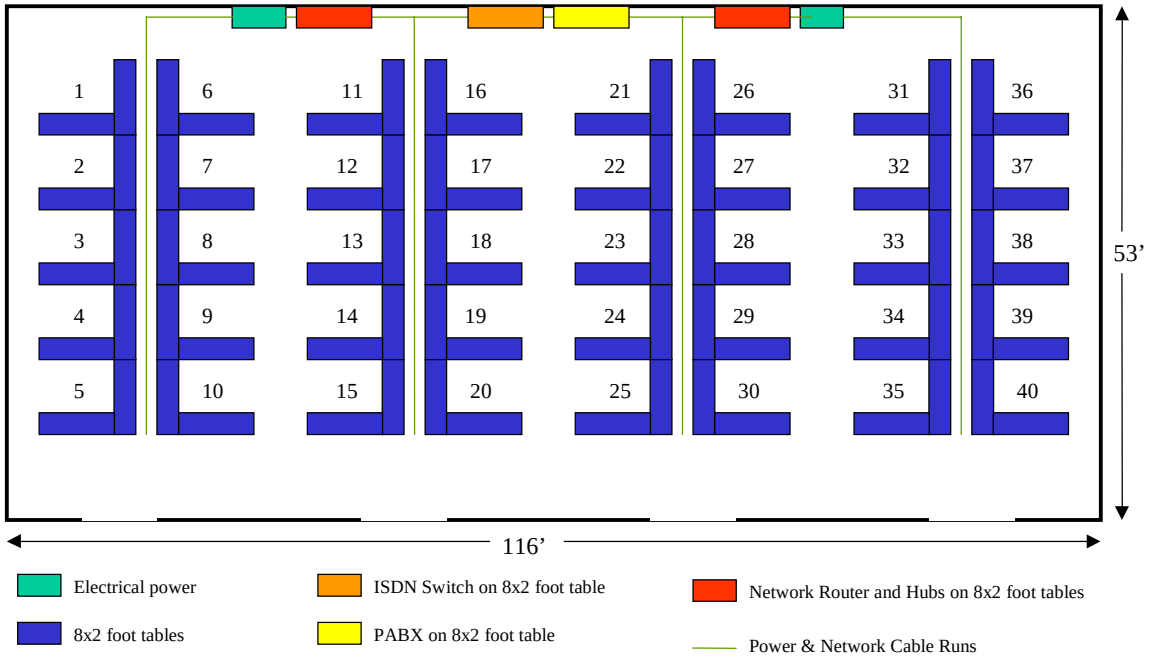

Figure 2: Example of room layout

- **Seating**: prearrange seating. It saves time and avoids space fragmentation. Put signs with company names on tables.
- **Microphone:** a must.
- **Computer connected to PC screen projector:** nice to have to project announcements on the wall, or changing schedules, map of the room, status of devices, etc. Should be visible from all places. A second PC screen projector would be nice, especially for displaying the map of the room permanently.
- **Printer:** a must (e.g. in business office of hotel). Should be operated as a self-service.
- **Copy machine:** a must (e.g. in business office of hotel). Should be operated as a self-service.
- **Security**: equipment is valuable, and people will ask how secure the place is. On-site security during the night may be required. However, hotels will have security patrolling the hotel and the surroundings anyway, and they may have e.g. motion alarm inside the building, so additional on-site security may not be necessary.

- **On-site catering:** engineers will be working long hours, and continue debugging software in the hotel. Coffee/tea/water is very much appreciated. Vending machines as well. Make sure that vending machines get filled up. If no sponsors for food can be found (costly: 3 sandwich lunches with potato salad + cookies + ice tea feeding 85 people can easily cost $5,000.-), it is recommended to have sandwiches brought in and the costs be shared by the participants. Going out to restaurants can be time-consuming. Snacks and refreshments should be available all the time (24 hours). If participants are charged for food, it has to be announced in advance.

- **Garbage cans:** easy to forget.

A.9 Network

The crucial part of the Interoperability event. "Pure" ITU-T Recommendation H.323 [2] interoperability events require only a LAN which can be set up relatively easily from scratch in a hotel within ½ - 1 day, and the necessary equipment (switches, hubs) is readily available. TIPHON interoperability events require in addition a phone network, e.g. a PBX with T1-PRI, E1-PRI and interfaces for the gateways, and analog lines for the telephones.

- **Power**: there has to be at least one power supply for each table. Some hotels have break-up (hubble) boards and can provide a dedicated circuit to each table. Make sure that hotels have long enough power cables that can reach from the break-up boards to the tables. In general, hotels have audio-visual staff who will take care of that. In a hotel, power has to be paid. Extensions should be provided by the participants.

- **Power Transformers**: a few spare power transformers should be available.

- **LAN:** all ports should be switched 10/100 Mbps Ethernet. Switching allows to filter the unicast Ethernet traffic between ports, and avoids LAN segments to be flooded by the traffic of each device; however, multicast and broadcast traffic is not filtered.
  VLANs (Virtual LANs) facilities allow in addition to test multicast messages, such as Gatekeeper auto-discovery, by keeping all the multicast traffic local to a given virtual LAN. Mini-hubs may be used on booth for using protocol analysers in parallel to device under test on the same switched port. One subnet is sufficient.

- **LAN-Cabling**: if there is no pre-wired network already in place, lots of cabling will be needed. Depending on where they are seated, people need to run to 20-30 m cables to switches or hubs. So be sure to have a role of 1000 ft cat 5 cable available.

- **Internet connectivity**: should be provided so that people can download latest software fixes and check their email, or to allow remote testing and remote debugging. It would be ideal for every table to have Internet connectivity. If cost is an issue, the cost for Internet access could be divided among the participants for an extra fee.

- **Telephony**: PBXs, or PSTN switches, with T1-PRI, E1-PRI, BRI, ... and analog interfaces. The switches should support protocols used in main parts of the world (e.g. 5ESS, DSS1, NI1, ...). In general, companies can support most protocols in the world, so the local ones may be fine. However, engineers present may have worked primarily with one interface only and run into configuration problems.
  The PBXs and/or PSTN switches should be connected to the outside world to provide connectivity for remote testing and support.
  An internal communication mean between participant should be provided, such as table phones, and wireless communication (e.g. DECT, talkie-walkie, ...). For future tests, support for SS7 and IN will be needed.

- **Telephones**: should either be provided or brought by the participants.

- **Test Tools:** Third-party ITU-T Recommendation H.323 [2] protocol analyser and LAN analyser will be very helpful in case of suspicious error situation. Additionally, ITU-T Recommendation H.323 [2] loader/traffic generator and IP traffic resequencer /delayer/loser could be very helpful for more elaborated tests. Voice quality measurement tools would become necessary in a near future.

A.10 Information Services

- **General Web Server:** it is important to have an easy accessible location of information during the event. The easiest way would be a Web server, not accessible from the outside. The following functionalities should be supported: upload and download of documents, display of time schedule, FAQ list, room map, available facilities, access to docbox, Do Not Disturb service...
- **Mail Server:** each participant should have access to an email server during the event. This can either be achieved by a local email server or by access to the public internet, so people can access their companies e-mail server. Be aware that some e-mail servers are only accessible if you are not running a firewall. Mailing lists should be used to distribute timely important information, questions of general interest.
- **VIMP (Virtual Interoperability Meeting Place):** the VIMP should be used to schedule ad-hoc testing and for providing detailed information about the features of tested devices.
- **Free/Busy Service:** this service should be used to indicate the current status of a device under test: "Free" (green), "Busy" (red). "Free" will indicate that the device is currently available for test. "Busy" will indicate that the device is currently involved in a test case or is not available. These flags could be sorted by device type and/or company, allowing a quick search for a specific device.
- **FAQ List:** a FAQ list should be maintained and easily accessible.

A.11 On-site Staff

- **Network and System Manager:** maintaining the network.
- **PBX Manager:** maintaining the telephone network.
- **Web/Email/VIMP Manager:** maintaining the information services.
- **Special Testing Tools Manager:** operating special test equipment.

These people need not to be present all the time, but should be sufficiently available and reachable during the test event (e.g. if the network or the PBX is down during the evening).

A.12 Conference Calls

It may be useful to have conference calls 2-3 weeks prior to the event in order to sort out final details with the participants.

A.13 Sponsors

Inquire about sponsors. Some companies may not sponsor an entire event but a lunch or a breakfast.

A.14 Event kit / Information package

An example of an event kit, i.e. invitation for the interoperability event, can be found on the ETSI TIPHON web site (http://www.etsi.org/tiphon).

A.15 Documents to have ready at the beginning of interoperability event

The following documents will have to be revised on the first day, but a first version should be ready upon arrival of the participants:

- **Floor plan**: prearrange seating and have a floor plan with company booths ready before the event.
- **Phone numbers and IP-addresses:** assigned to all companies should be written up in advance and handed out to the companies.
- **List of participants.**
- **Name badges**: needed to make sure no one unauthorized enters the facilities. It also helps to get people to know each other. Have also first names on name badges.

A.16 Running the event

Scheduling: can be a nightmare. There are 3 ways to do scheduling:

1) **Ad-hoc testing:** companies find their own partners on site and test whatever they want to test. Good for debugging.
2) **Scheduled tests:** companies are assigned time slots, what to test, and with whom to test, and score the result of the test. Goal is not to debug but to get a measure of interoperability.
3) **Ad-hoc scheduled test:** companies are assigned time slots and with whom to test, but can test whatever they want.

Some guidelines:

- Almost all participants prefer ad-hoc tests because it gives them time to debug. About 2/3 of the time should be reserved for ad-hoc tests.
- Do ad-hoc testing on the first day. People may still be setting up their equipment.
- Put scheduled testing towards the end when some confidence has been achieved (last 2 days), or do ad-hoc – scheduled – ad-hoc – scheduled testing.
- Make time slots of scheduled tests large enough. 15 minutes seems too small.
- An entire day of scheduled testing is very demanding. May do scheduled in the morning, ad-hoc in the afternoon.
- Schedule complex tests not at the end of a period because people are tired.
- If scheduled testing is done, may want to run part of it like a drill: have someone with a microphone tell everybody to stop with test x and move to test y; x minutes left for test y, etc. If this is not done, people will drift off and do ad-hoc testing.

trouble-shooting: network staff is needed full-time until everyone is connected. Once everyone is connected, things are usually relatively quiet, but network staff has to be prepared to jump in any time to fix problems.

questionnaire: towards the end of the interoperability event, distribute questionnaire to get feedback on the interoperability event.

social event: nice to have. If not sponsored, ask who wants to go to some place for dinner.

odds and ends: have office supplies ready, additional power plugs, adapters, duct tape, …

A.17 After the interoperability event

- Companies have to send back their equipment. Make sure that people don’t forget to put the correct shipping information on their boxes. It happens frequently that shipping orders are missing, or are not correctly filled out.
- If score sheets were collected, evaluate.
- If questionnaire has been distributed, evaluate.

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

- http://docbox.etsi.org/tech-org/tiphon/Document/tiphon/05-9905-Bangkok/13TD094-guidelines-for-organization-of-interops.doc

- http://docbox.etsi.org/tech-org/tiphon/Document/tiphon/05-9901-InterOp/invite_r1.doc

History

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