

I.D.E.A.L. OVERVIEW

Audience:

Institute of Electrical and Electronics Engineers



July 11th - 16th, 2004
Portland, OR

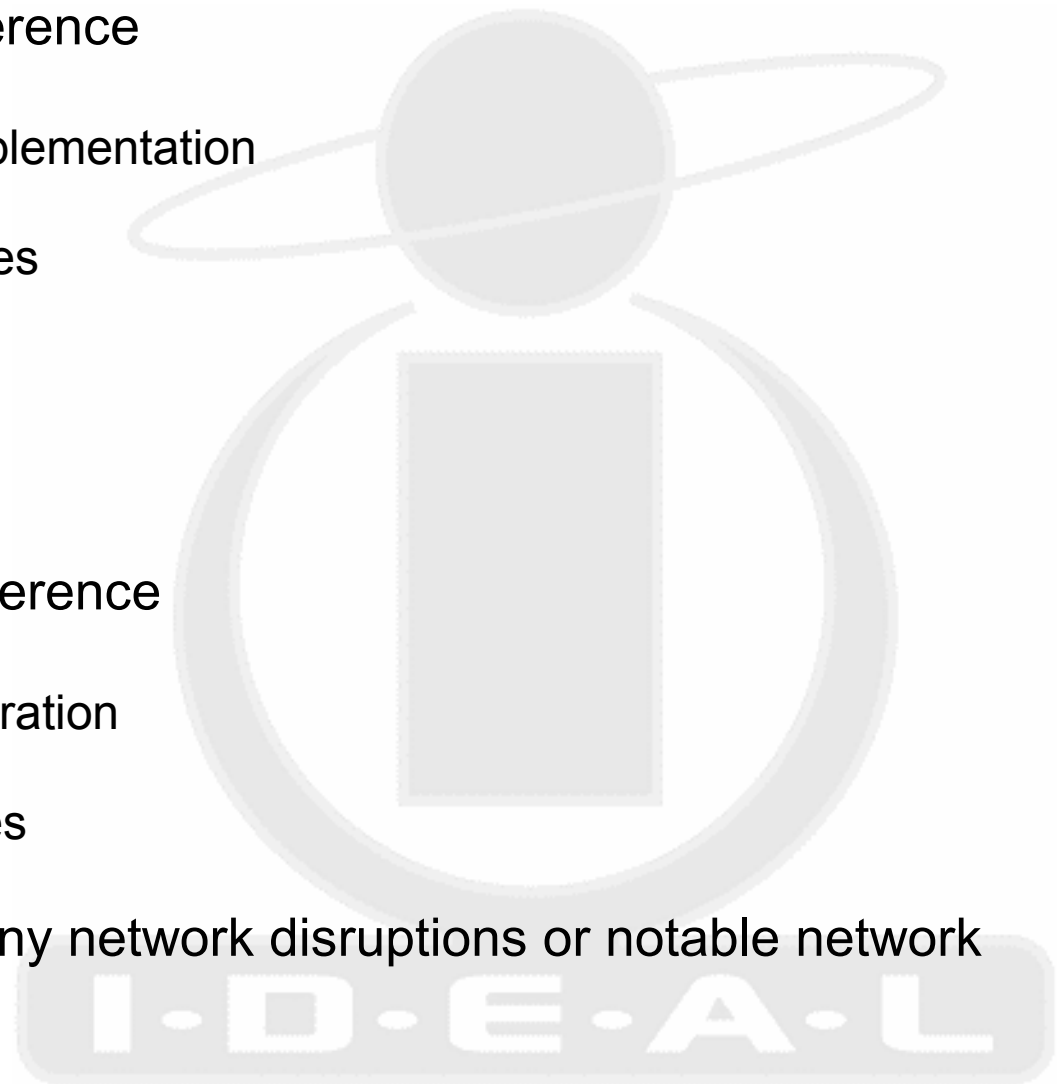
Prepared by:

Michael P. Rhing,
Systems Administrator
I.D.E.A.L. Technology Corporation



NETWORK PLAN

- Provide network support for conference
 - Network topology design and implementation
 - Management of network resources
 - Facilitate Internet access
 - File and print server access
- Provide end user support for conference
 - Wireless and wired client configuration
 - Diagnose and resolve VPN issues
- Communicate with all members any network disruptions or notable network issues

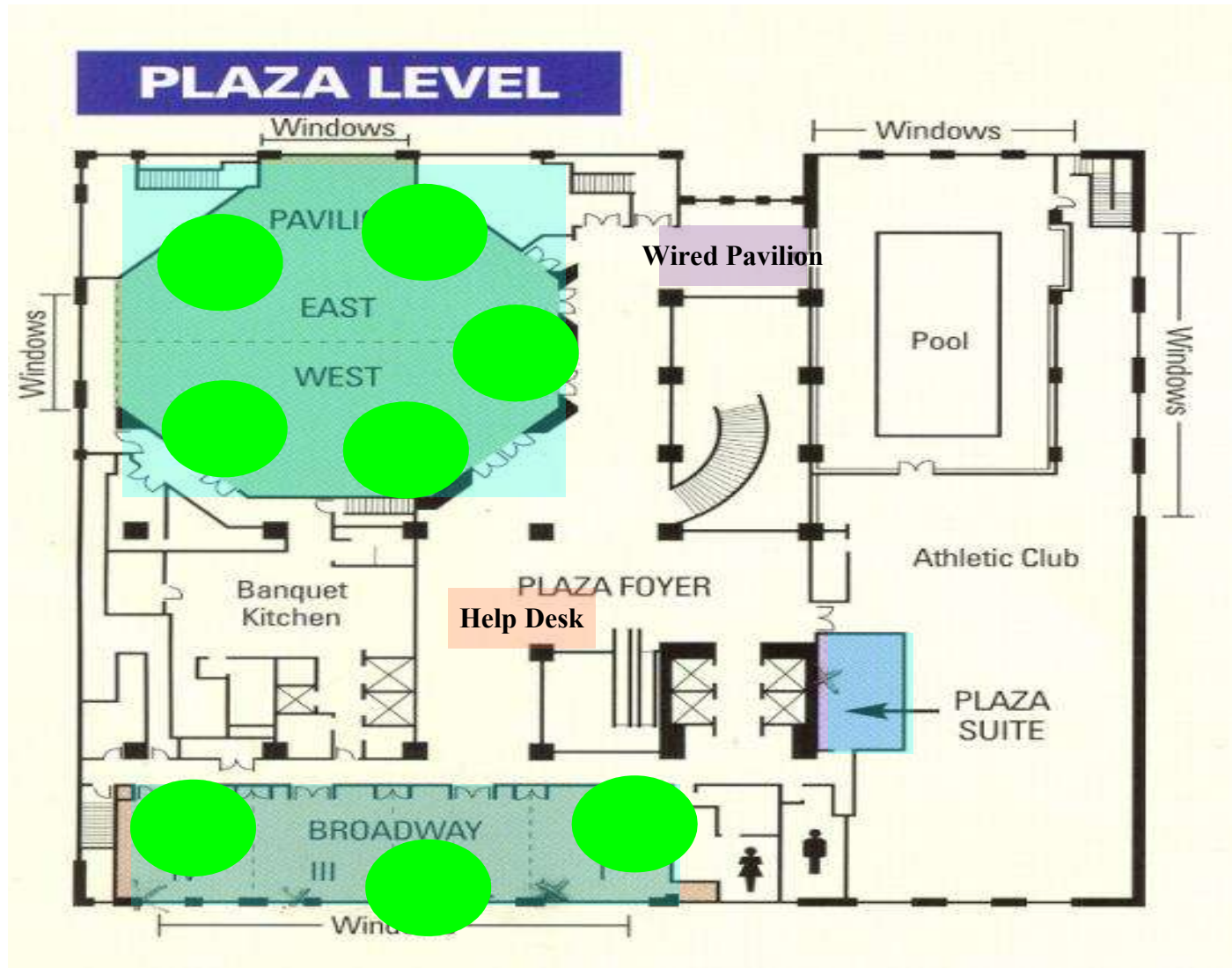


NETWORK AVAILABILITY

- “20Mb” wireless link was provided by Winfield Wireless was secured and “tested” by Winfield Wireless before arriving to the property.
- Bridge between Hilton and Embassy Suites tested for connectivity.
- Worked with Winfield Wireless and Hilton staff to set up Internet access by 12:30pm Saturday afternoon.
- Worked with Winfield Wireless and Embassy staff to properly set up Internet access by 12:00pm Sunday afternoon.
- Deployment of access points and all services completed by 10:00pm Sunday.
- All services were active and available on time for conference



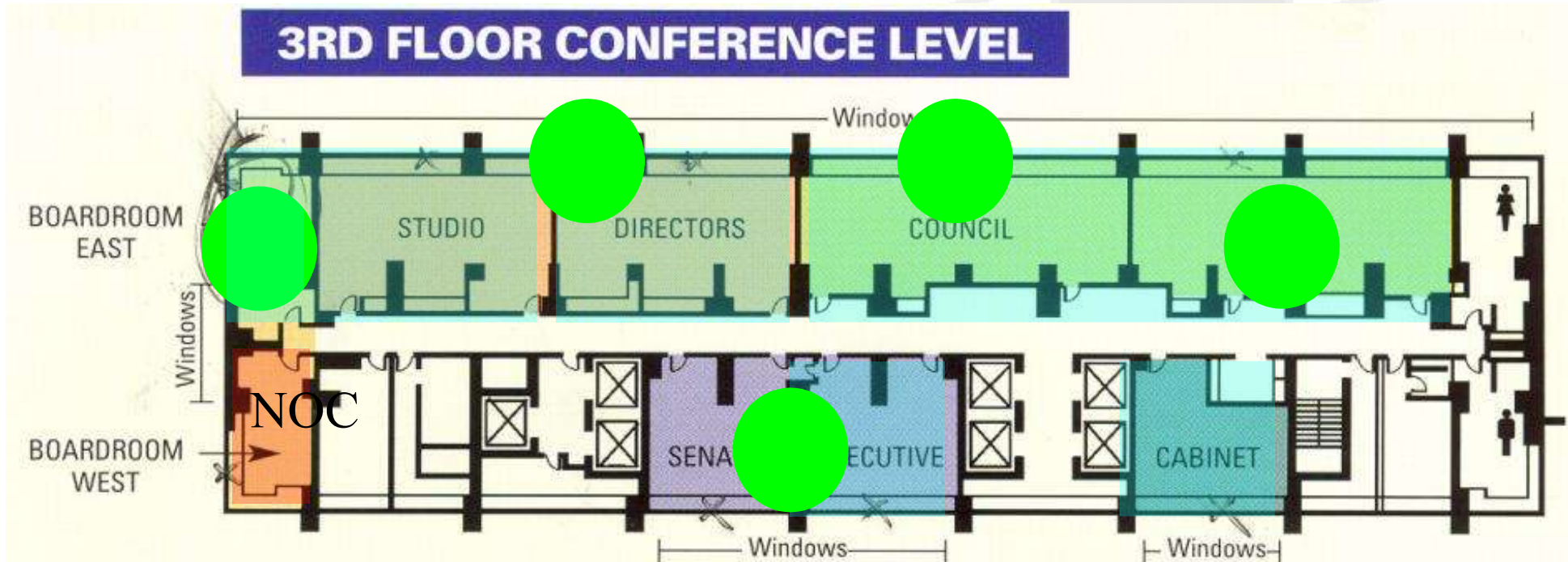
HILTON PLAZA LEVEL



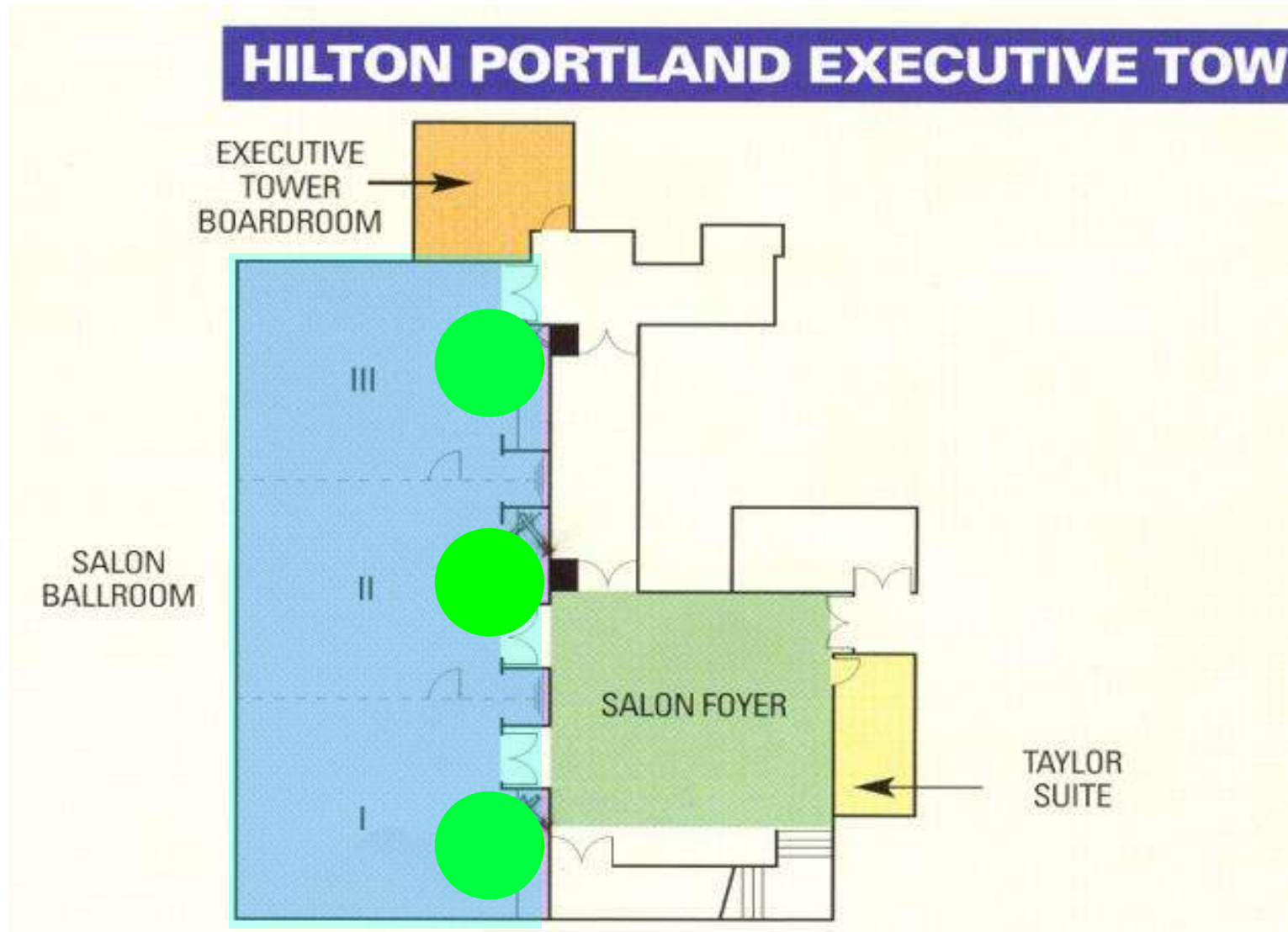
HILTON BALLROOM LEVEL



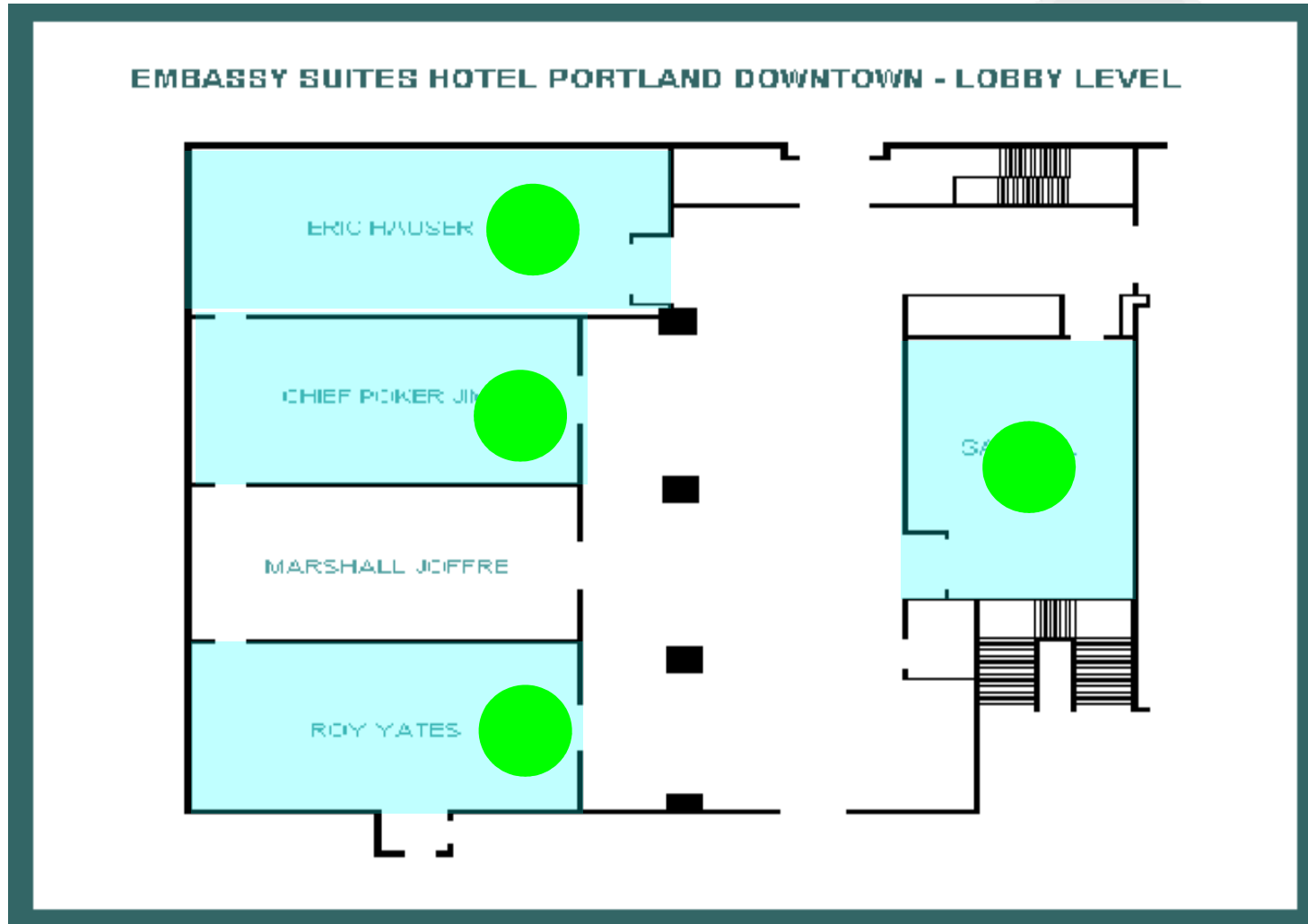
HILTON CONFERENCE LEVEL



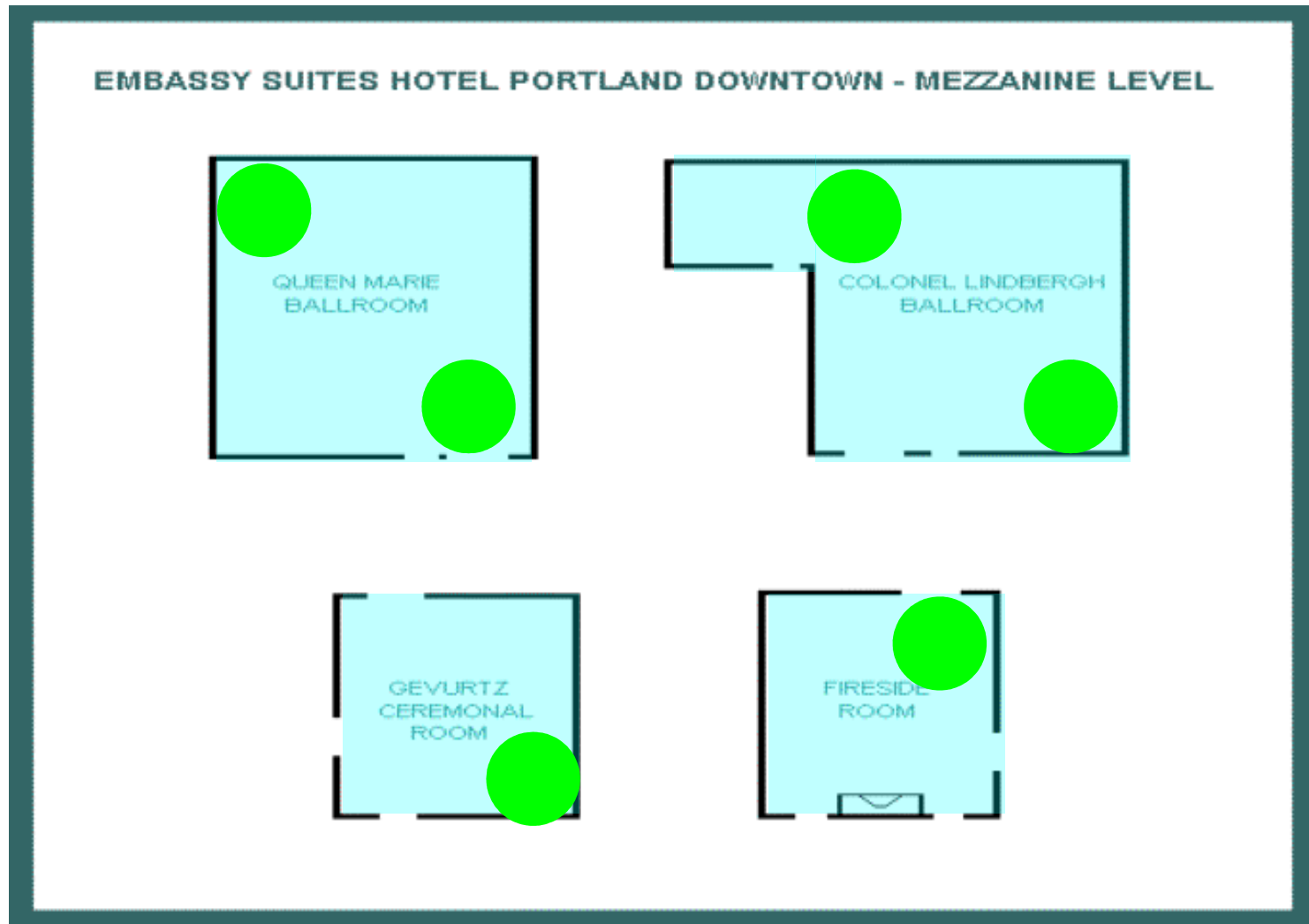
HILTON EXECUTIVE TOWER



EMBASSY SUITES LOBBY LEVEL



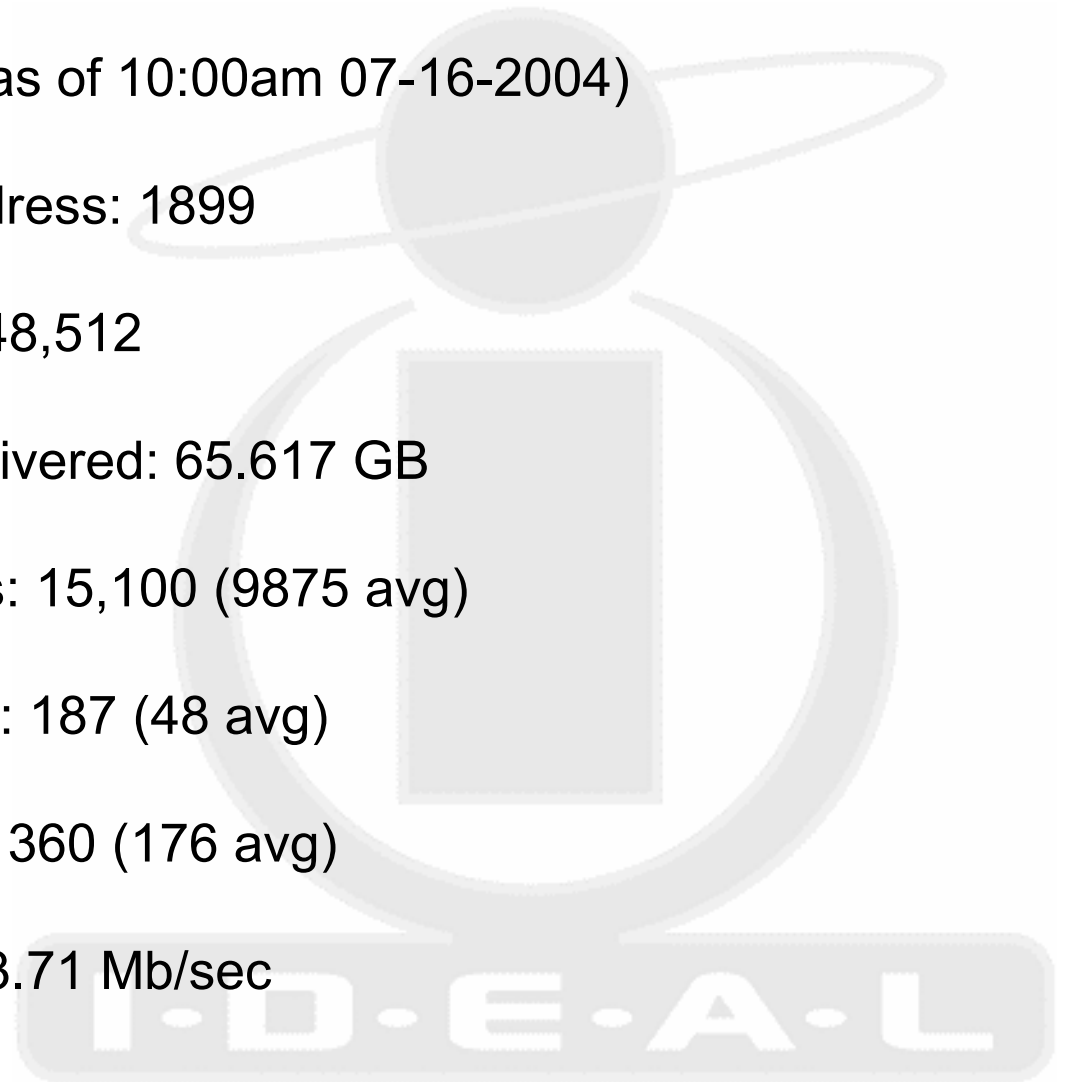
EMBASSY SUITES MEZZANINE



NETWORK STATISTICS

(Statistics accurate as of 10:00am 07-16-2004)

- Unique devices requesting IP address: 1899
- Total HTTP requests served: 8,348,512
- Total Gigabytes of HTTP data delivered: 65.617 GB
- Max simultaneous Masq sessions: 15,100 (9875 avg)
- Max simultaneous IPSEC tunnels: 187 (48 avg)
- Max simultaneous PPTP tunnels: 360 (176 avg)
- Max Internet access utilization: 13.71 Mb/sec



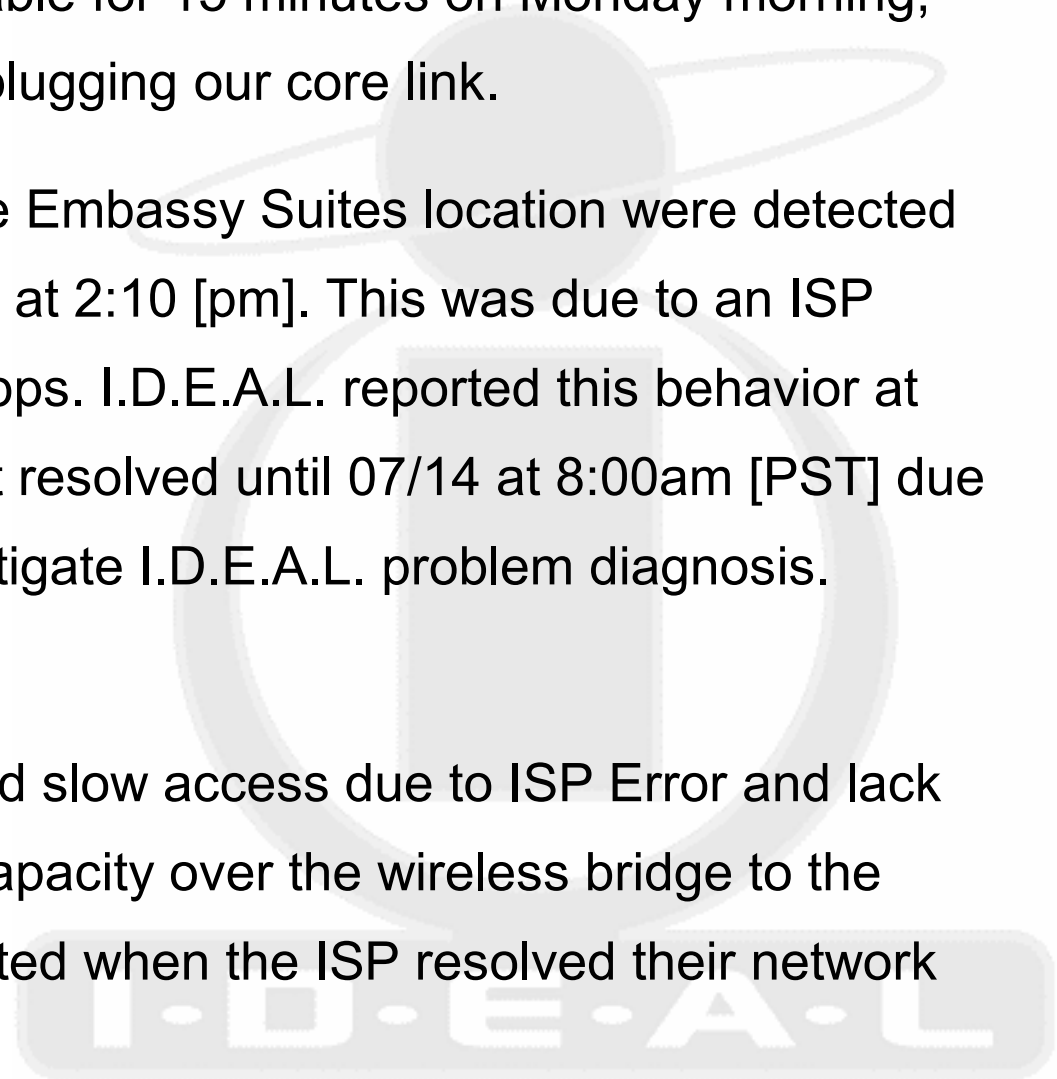
NETWORK CLIENTS

32 3com Corporation	4 Cameo Communications, Inc.	350 Intel Corp	1 Silicom, Ltd.
2 Abocom Systems, Inc.	1 Cc&C Technologies, Inc.	5 Intersil Corp.	1 Sitecom Europe Bv
1 Accton Technology Corp.	183 Cisco Systems, Inc.	1 Ip One, Inc.	11 SMC Networks, Inc.
7 Acer Technologies Corp.	1 Cnet Technology Inc.	1 Leichu Enterprise Co., Ltd.	17 Sony Corporation Ltd.
1 Acrowave Systems Co., Ltd.	5 Compal Electronics, Inc.	1 Lg Electronics, Inc.	3 Sychip Inc.
30 Actiontec Electronics, Inc.	1 Corega K.K.	14 Lucent Technologies	6 Symbol Technologies, Inc.
196 Agere Systems	1 Cybertan Technology, Inc.	1 Marvell Semiconductor, Inc.	1 Test-Um Inc.
7 Airgo Networks, Inc.	1 D-Link	4 Matsushita Electric Ind. Co	1 Texas Instruments
46 Aironet Wireless Communication	25 D-Link Corporation	8 Megahertz Corporation	77 The Linksys Group, Inc.
1 Airvast Technology Inc.	24 D-Link Systems, Inc.	13 Melco Inc.	10 Toshiba Corporation
1 Allied Telesis, K.K.	19 Dell Computer Corp.	2 Micro-Star International Co., Ltd	4 U.S. Robotics, Inc.
1 Alps Electric Co., Ltd.	6 Dell Esg Pcba Test	13 Microsoft Corp.	9 Usi
3 Ambicom, Inc.	8 Dell Pcba Test	3 MMC Technology, Inc.	1 Victor Company Of Japan, Ltd.
89 Ambit Microsystems Corporation	7 Delta Networks, Inc.	1 Module Department	1 Vmware, Inc.
13 Ani Communications Inc.	3 Edimax Technology Co., Ltd.	5 NEC Corporation	1 Vulcan Portals Inc
38 Apple Computer, Inc.	5 Enterasys Networks	76 Netgear, Inc.	1 Wistron Corp.
1 Arima Computer Corp.	5 Epigram, Inc.	1 No Wires Needed Bv	3 Wistron Neweb Corp.
31 Askey Computer Corp.	1 Ericsson Group	17 Nortel Networks	1 Woonsang Telecom, Inc.
3 Asustek Computer Inc.	15 Farallon Computing/Netopia	1 Palm Inc.	6 Ww Pcba Test
6 Atheros Communications, Inc.	1 Fi Win, Inc.	34 Philips Components	1 Xerox Corporation
11 Belkin Components	12 Fujitsu, Ltd	3 IBM Japan Co, Ltd	48 Xircom
1 Bell Technologies	109 Gemtek Technology Co., Ltd.	17 Proxim, Inc.	3 Z-Com, Inc.
1 Benq Corporation	2 Giga Fast E. Ltd.	2 Ralink Technology, Corp.	1 02:02:3F
6 Bermai Inc.	2 Global Sun Technology, Inc.	1 Realtek Semiconductor Corp.	1 02:03:8A
3 Broadcom Corporation	45 Hewlett-Packard Company	54 Samsung Electronics Co., Ltd.	1 02:0B:CD
1 Bromax Communications, Ltd.	5 I-O Data Device, Inc.	1 Sharp Corporation	1 F2:BF:0A
1 Cabletron - Yago Systems, Inc.	34 IBM Corporation	1 Siemens Ag	1899 Total



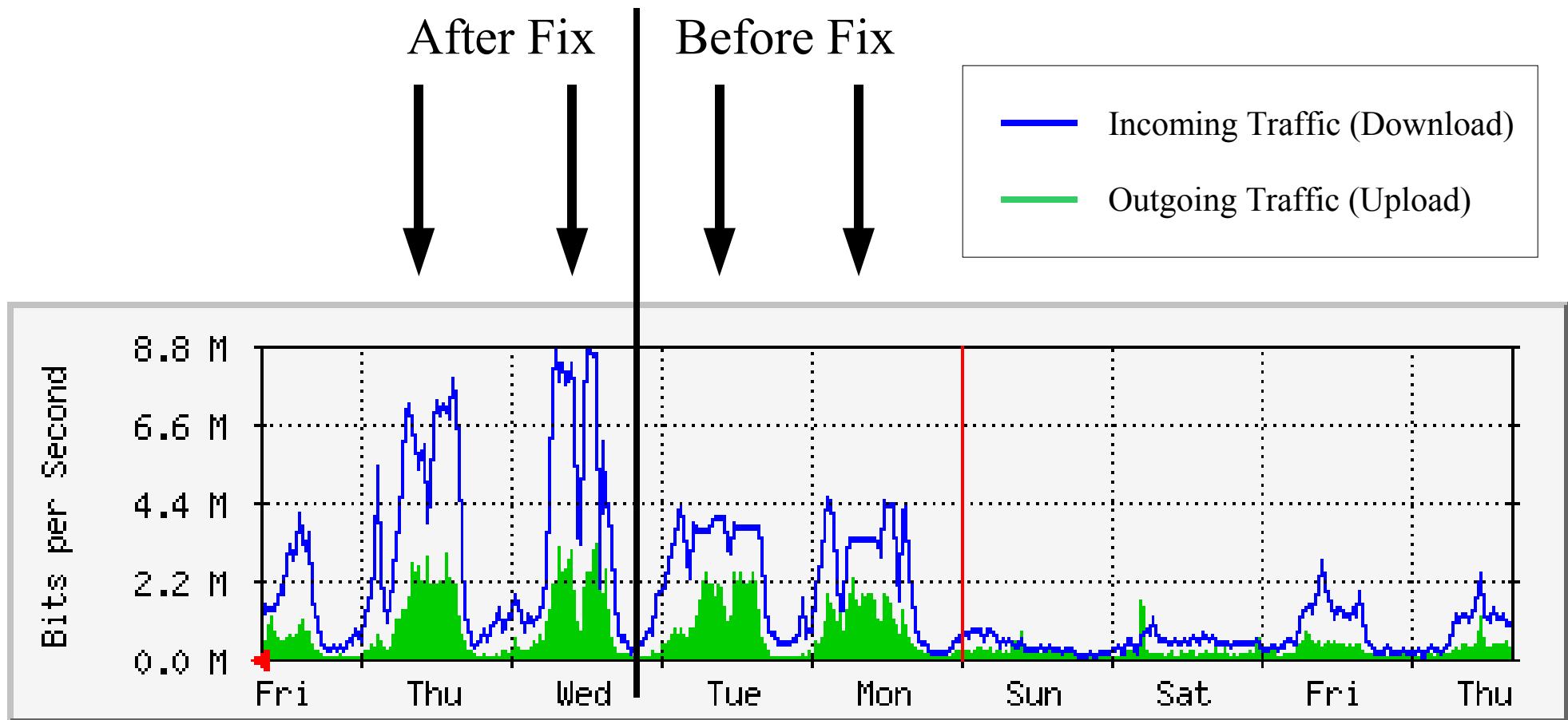
NETWORK ISSUES

- Internet connectivity was unavailable for 15 minutes on Monday morning, caused by a Hilton technician unplugging our core link.
- Severe Network slowdowns at the Embassy Suites location were detected and diagnosed on Monday 07/12 at 2:10 [pm]. This was due to an ISP Error of throttling network to 10Mbps. I.D.E.A.L. reported this behavior at 7:22pm [PST] 07/12. Issue wasn't resolved until 07/14 at 8:00am [PST] due to vendor being unwilling to investigate I.D.E.A.L. problem diagnosis.
*Please see attached report.
- Embassy Suites hotel experienced slow access due to ISP Error and lack of required, contracted network capacity over the wireless bridge to the other hotel. The issue was corrected when the ISP resolved their network configuration problems.



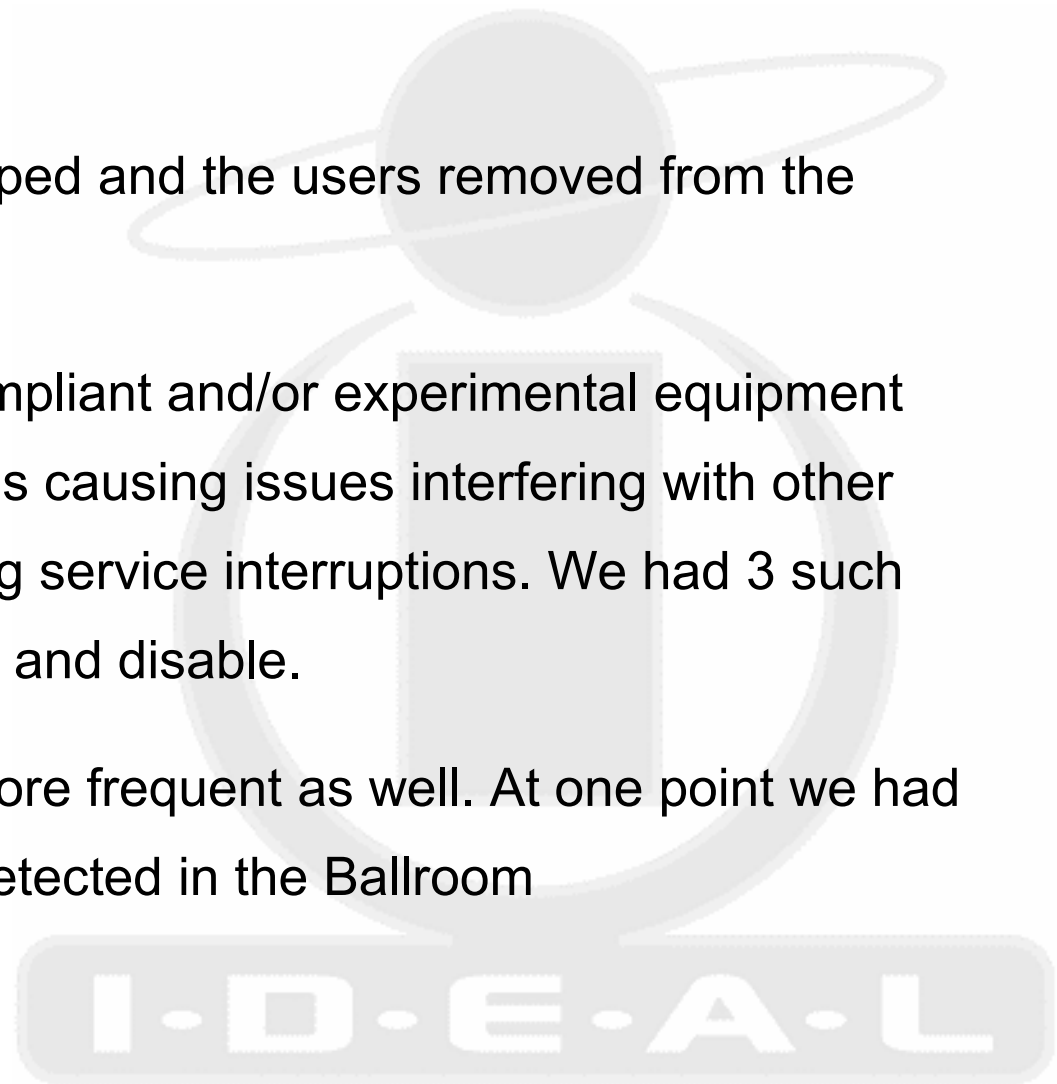
ISSUES II

Internet traffic logs during the conference week. These logs were used to diagnose the problem with the Internet access bandwidth and clearly demonstrate the issue. This data was captured from our Gateway server.

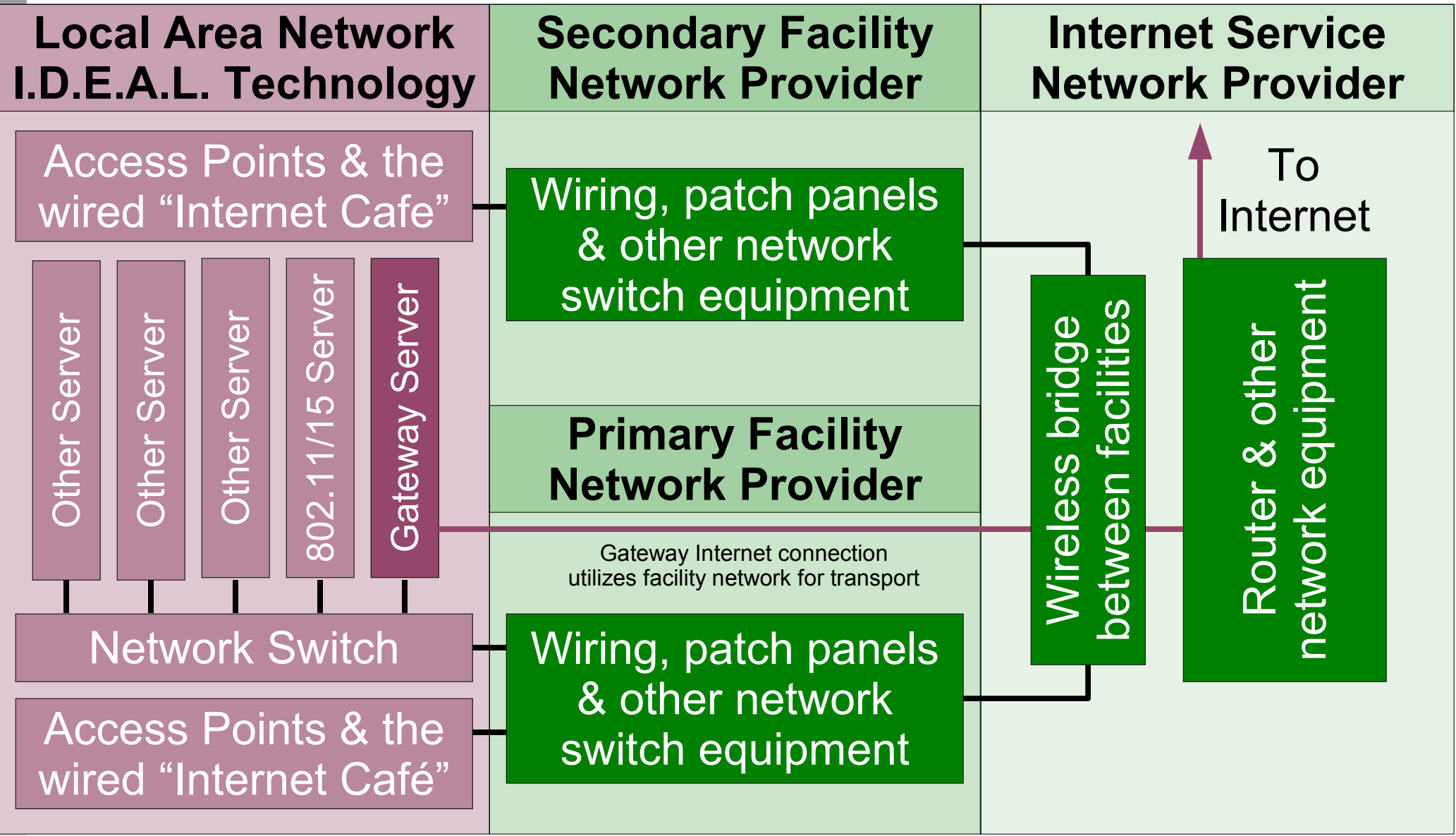


ISSUES III

- 15 Worms and Viruses were stopped and the users removed from the network.
- Attendees are bringing in non-compliant and/or experimental equipment and using it on the network. This is causing issues interfering with other attendees equipment, and causing service interruptions. We had 3 such cases that we were able to detect and disable.
- AdHoc networks are becoming more frequent as well. At one point we had 4 “IEEE” adhoc networks being detected in the Ballroom

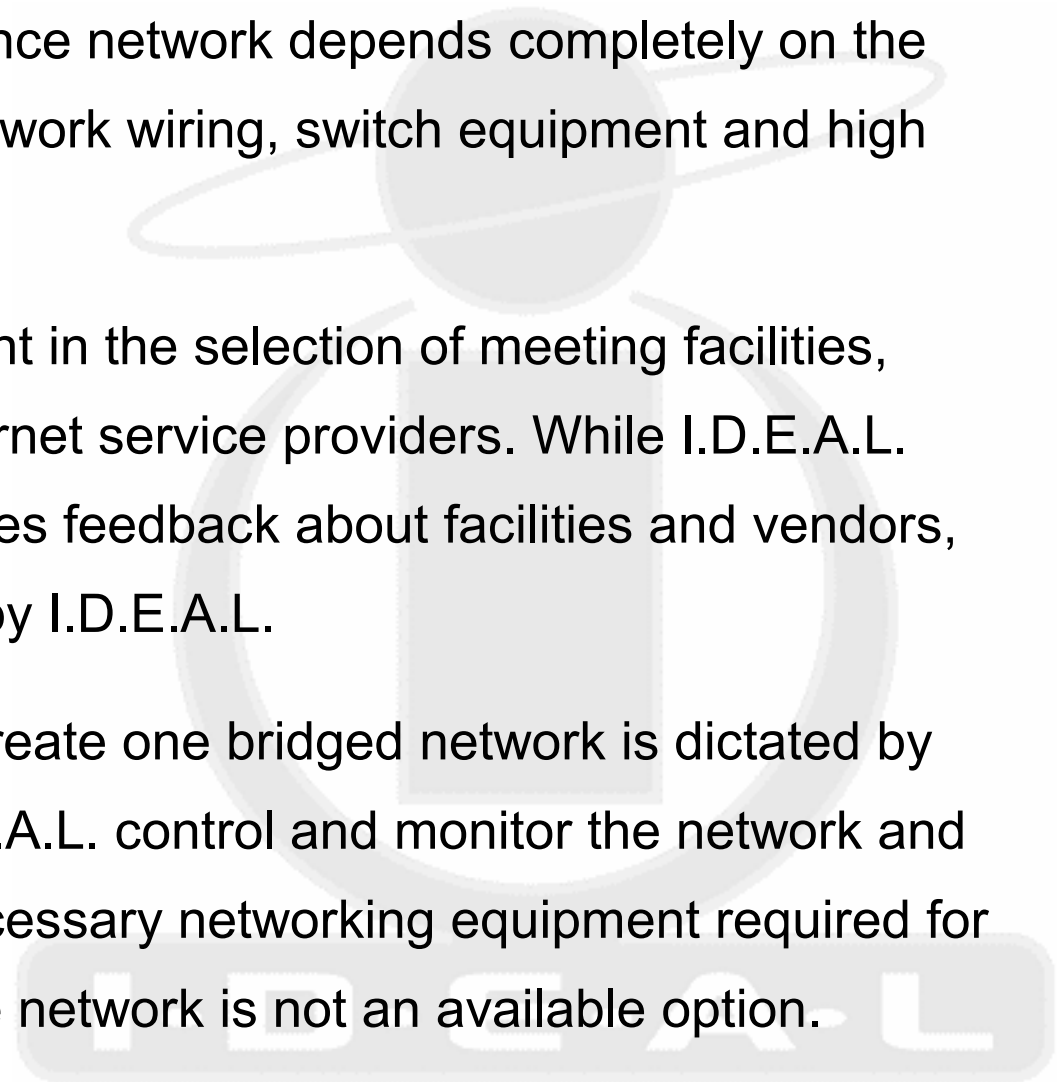


NETWORK BLOCK DIAGRAM



NETWORK DESIGN NOTES

- The success of the IEEE conference network depends completely on the availability and quality of local network wiring, switch equipment and high speed Internet service.
- These critical qualities are inherent in the selection of meeting facilities, network service vendors and Internet service providers. While I.D.E.A.L. makes recommendations and gives feedback about facilities and vendors, the final decisions are not made by I.D.E.A.L.
- The network design decision to create one bridged network is dictated by the contract. It requires that I.D.E.A.L. control and monitor the network and when coupled with the lack of necessary networking equipment required for segregated networks, splitting the network is not an available option.



NETWORK DESIGN NOTES (CONT)

- Many facilities have contracts with wireless service providers that forbid them turning off or adjusting the network parameters on their access points to make co-existence with the IEEE network easier. There is no easy solution to this problem.
- I.D.E.A.L. Technology staff has been involved in commercial 802.11 wireless deployments as far back as 1998 for companies like Harris Semiconductor Corporation and Nokia
 - We have significant experience providing high-density, wireless coverage including design considerations like radio output power, antenna selection, access point placement, and monitoring / management of access point load during utilization
 - Our recommendations for networking equipment is based on our professional experience and the requirements of this network. We can defend our recommendation of specific vendors and products based upon their enterprise features for management and monitoring (SNMP, output power control, power-over-Ethernet, etc.)
 - If anyone has questions about the network design or technologies utilized by I.D.E.A.L. to support the IEEE should contact Tony Awtrey for clarification. (tony@idealcorp.com – 407-999-9870 x13)

SERVICES UNDER CONTRACT

Network services provided by gateway server:

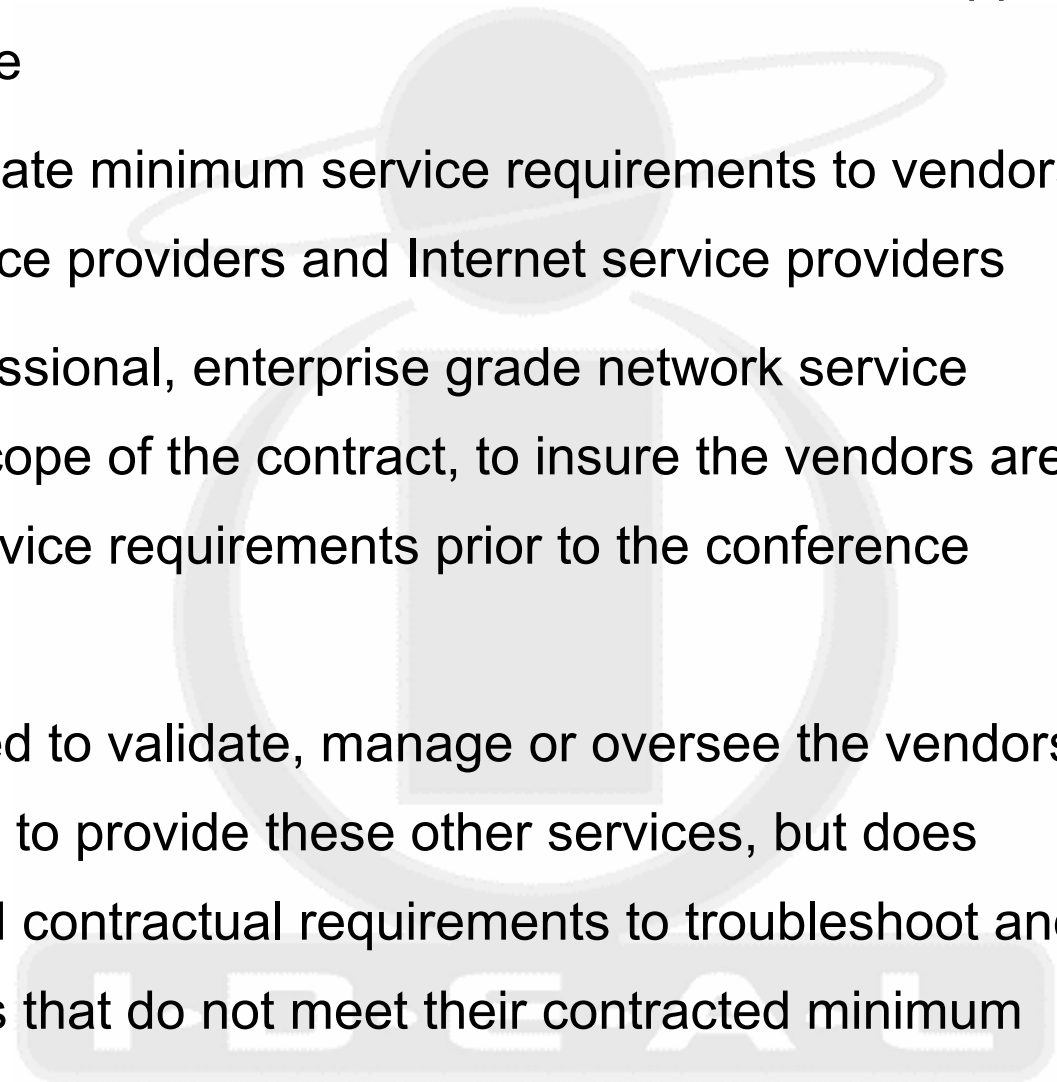
- Network address translation (for Internet access)
- Caching proxy to accelerate web access speed and to conserve bandwidth
 - Transparent port redirection requires no client configuration
- Firewall protection from hostile Internet activity
- Support multiple simultaneous VPN connections for both IPsec and PPTP technologies
- Forwarding of outbound email from clients
 - Transparent port redirection requires no client configuration
 - Performing outbound Anti-Virus scanning **(service not covered under current contract)**
- Local DNS services
- DHCP (automatic network configuration)
- Network printer support
 - Automatic Windows printer driver installation reduces client configuration issues

Other services provided:

- Maintenance of IEEE equipment
- Communication with facilities and vendors
- Design and installation of wireless network
- Support and monitor group-specific servers when requested, including 802.11/15 attendance server
- Help desk for conference attendees
- Monitoring of all network equipment and critical network services
- Collection of network statistical data to document performance and help estimate future needs
- Detection and elimination of disruptive clients on the network due to viruses, worms or other issues **(service not covered under current contract)**

CONTRACT CLARIFICATION

- I.D.E.A.L. is contracted to provide on-site local network services and direct support of members attending the conference
- I.D.E.A.L. is contracted to communicate minimum service requirements to vendors such as the local hotel network service providers and Internet service providers
- I.D.E.A.L. expects to work with professional, enterprise grade network service providers and attempts, within the scope of the contract, to insure the vendors are capable of meeting the minimum service requirements prior to the conference week
- I.D.E.A.L. is not contractually required to validate, manage or oversee the vendors selected and contracted by the IEEE to provide these other services, but does generally perform above and beyond contractual requirements to troubleshoot and resolve problems caused by vendors that do not meet their contracted minimum service levels.



I.D.E.A.L. PAST PERFORMANCE

- March 2003 – Stepped up to provide network services when equipment did not arrive with no contract or promise of payment
- May 2003 – Identified and documented reverse DNS issue. IEEE was not required to pay for Internet service
- July 2003 – Identified and documented ISP failure to properly configure multiple T-1 lines. IEEE received discounted Internet service
- September 2003 – Worm infestation crippled network. I.D.E.A.L. designed and wrote custom application to detect and eliminate disruptive network behavior
- November 2003 – Worked above and beyond contact requirements to find solution for complete lack of facility network and bridge between hotel and convention center
- January 2004 – Identified and documented issues with Internet performance. IEEE received discounted Internet service
- March 2004 – Forced ISP / facility network staff to replace poor quality network equipment and to correct reverse DNS issue prior to conference
- July 2004 – Identified and documented Internet performance issues. IEEE received discounted Internet service

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