# VOLUME 1, SECTION 3.13:

# COMBINED SERVICES

# 3.13 COMBINED SERVICE [C.2.6.1, M.6.1]

Level 3 has assembled a collection of separate telecommunications services and packaged them into a single Combined Service (CS) offering to form a core telecommunications service that addresses Government customers' fundamental business requirements.

## 3.13.1 TECHNICAL DESCRIPTION OF COMBINED SERVICES (C.2.6.1)

Level 3's Combined Services (CS) package builds on the superlative Voice Services (VS) core service, adding best in class features to build a cohesive enterprise telecommunications service.

The following diagram shows the relationship between the four logical entities in a switched services network:

1. Customer Networks
2. Level 3 switching network
3. Level 3 Signaling System 7 management network
4. Public Switched Telecommunications Network

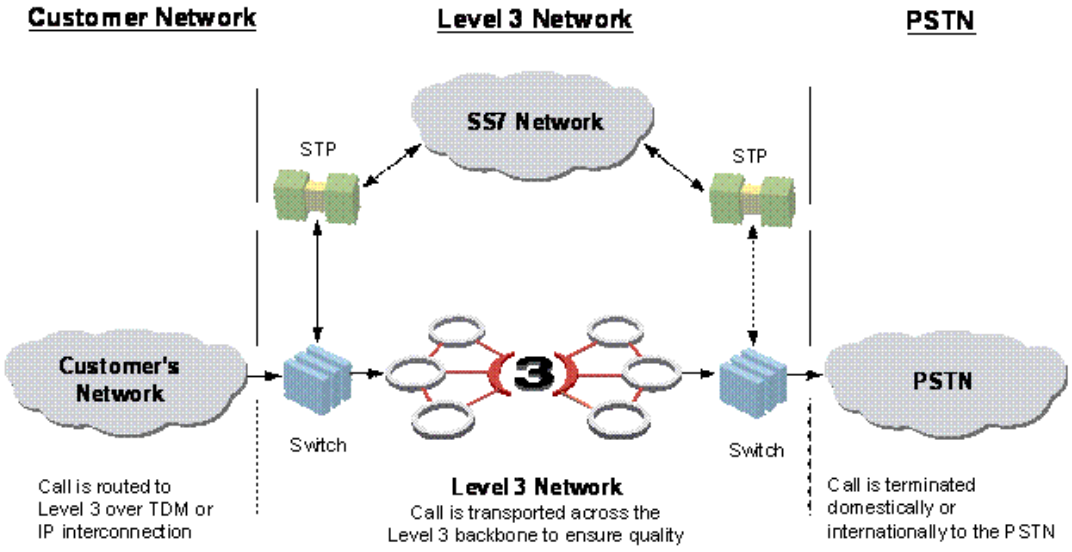


Figure 3.13-1 Level 3's combined services will deliver quality services to meet Agency needs.

The Level 3 core infrastructure was built to provide the highest performance, most reliable telecommunications transport platform available. The following diagram shows the relationship between the components of the Level 3 core and their interdependencies.

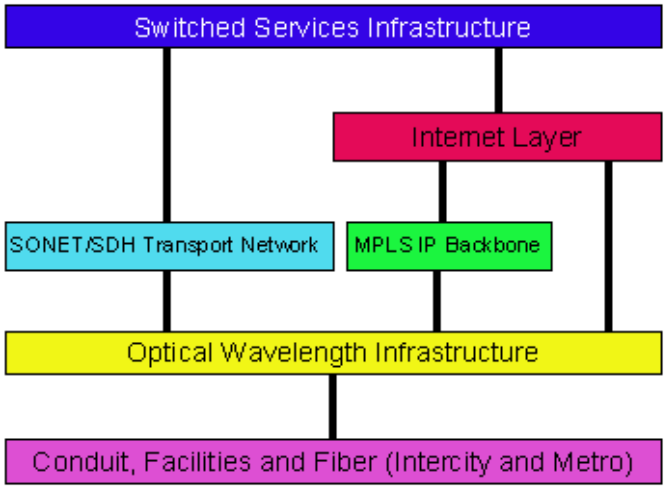


Figure 3.13-2 The Level 3 network is built for the delivery of quality voice services.

Level 3's Combined Service offering fulfills the service requirements contained in RFP Section C.2.6.1.1. This section demonstrates our capabilities in the following areas:

1. Standards
2. Connectivity
3. Technical Capabilities
4. Features
5. Interfaces

### 3.13.1.1 Standards (C.2.6.1.1.2)

Level 3 Combined Services comply with the following standards, as applicable to the particular services and functions being delivered. After award, Level 3 may propose alternatives at no additional cost to the Government that meet or exceed the provisions of the standards listed below.

1. ANSI T1.101
2. ANSI ISDN
3. ANSI SS7 standards
4. Telcordia Notes on the Networks, Issue 4, October 2000
5. All applicable Telcordia, ANSI, and ITU Standards
6. 6. ITU-T E.164 as interpreted by the Industry Number Committee of ATIS
7. All applicable Telcordia, ANSI, and ITU Standards
8. Level 3 is actively involved in developing, certifying and validating new versions, amendments, and modifications to the above documents and standards before they are offered commercially.

### 3.13.1.2 Connectivity (C.2.6.1.1.3)

Level 3 is the nation's biggest CLEC, allowing for the most comprehensive voice termination portfolio. As such, Level 3 maintains effective, high-performance connectivity with all major LECs and most minor LECs as well.

Level 3 Combined Services support connectivity to and interoperate with:

- Government specified terminations (such as single-line telephones, Secure Telephone Unit (STU) III, multiline key telephone systems, conference-room audio equipment, PBX, Centrex, T1 MUX, modem, FAX, and video teleconferencing systems)
- Public Switched Telephone Network (PSTN), including both wireline and wireless networks, in domestic and non-domestic locations
- All other Networx Universal and Networx Enterprise Voice Services Contractors' networks
- Inmarsat (terminal types A, B, M, Mini-M, and Aeronautical) for calls terminating to Inmarsat

### 3.13.1.3 Technical Capabilities (C.2.6.1.1.4)

Level 3 has selected a set of Combined Services (CS) capabilities that will satisfy Government customer normal requirements.

#### 3.13.1.3.1 Local, Regional Toll, And Domestic Long Distance (CONUS and OCONUS) Calling Capabilities With Unlimited Usage

Level 3 will provide local, regional toll, and domestic long distance (CONUS and OCONUS) calling capabilities with unlimited usage as the core service in a single Combined Service package.

As a certified competitive local exchange carrier (CLEC) in all 50 states, with connectivity in every long distance tandem switching office in the country,

Level 3 is uniquely positioned to deliver local and CONUS and OCONUS long distance services.

### 3.13.1.3.2 Non-Domestic Long Distance Calling Services.

To supplement the core CS, Level 3 will offer Non-Domestic Long Distance Calling Services.

In addition to domestic network connectivity, Level 3 is able to deliver long distance calling to over 220 countries around the world.

### 3.13.1.3.3 Single Invoice

A single invoice will be provided for all services in the Level 3 CS package.

Because Level 3's local, and long distance services were deliberately developed as cooperative products, Level 3's billing and invoicing systems are able to generate a single invoice for all CS services.

### 3.13.1.3.4 Applicable Local and FCC Regulatory Requirements

Level 3 complies with all applicable local and FCC regulatory requirements, including Local Number Portability (LNP), directory assistance, and emergency services (911 or E911) requirements to identify the location of an originating station and route them to the appropriate Public Safety Answering Point (PSAP)

As a CLEC in all 50 states, Level 3 pays particular attention to adherence to local, state and federal regulations. To support the Level 3 VoIP platform – and government regulation concerning 911 and E911 service – Level 3 purposely built connectivity into an unprecedented 3,517 rate centers and 5,463 PSAPs. Because of this, other VoIP carriers contract with Level 3 to deliver emergency services calls.

### 3.13.1.3.5 Non-Domestic Dialing

Level 3 will allow non-domestic dialing and will also allow the subscribing agency to restrict non-domestic calling on request.

Level 3's long distance network supports direct dialing to over 220 international destinations. Non-domestic calling may be restricted by the Level 3 voice platform, if a customer desires.

### 3.13.1.4 Features (C.2.6.1.2)

Recognizing that our customers may wish to take advantage of Level 3's extensive international calling capabilities, Level 3 will provide non-domestic long distance calling capability as an option for the Combined Services (CS) package. Customers may selectively block this feature by station and country code on request.

### 3.13.1.5 Interfaces

Level 3 offers the User-to-Network interfaces (UNIs) at the SDP as described in the table below as standard service features:

| Combined Services Interfaces (C.2.6.1.3.1) | | | |
|---|---|---|---|
| **UNI Type** | **Interface Type and Standard** | **Payload Data Rate or Bandwidth** | **Signaling Type** |
| 6 | Digital Trunk: T1 (Std: Telcordia SRTSV-002275 and ANSI T1.102/107/403) | Up to 1.536 Mbps | T1 Robbed-Bit Signaling |
| 7 | Digital Trunk: ISDN PRI T Reference Point (Std: ANSI T1.607 and 610) | Up to 1.536 Mbps | ITU-TSS Q.931 |
| 8 | Digital: T3 Channelized (Std: Telcordia GR-499-CORE) | Up to 43.008 Mbps | SS7, T1 Robbed-Bit Signaling |

| Combined Services Interfaces (C.2.6.1.3.1) | | | |
|---|---|---|---|
| **UNI Type** | **Interface Type and Standard** | **Payload Data Rate or Bandwidth** | **Signaling Type** |
| 10 | Optical: SONET OC-1 (Std: ANSI T1.105and 106) (Optional) | 49.536 Mbps | SS7 |
| 11 | Electrical: SONET STS-1 (Std: ANSI T1.105 and 106) (Optional) | 49.536 Mbps | SS7 |
| Table 3.13-1 Details the Level 3 Combined Services interfaces. | | | |

### 3.13.2 REQUIRED PERFORMANCE METRICS (C.2.6.1.4)

In accordance with RFP Section C.2.6.1.4.1, Level 3 will provide the performance metrics (as clarified in this proposal in Section 3.13.6) shown in the table below, for our Combined Services offering.

| Combined Services Performance Metrics | | | |
|---|---|---|---|
| Key Performance Indicator (KPI) | Service Level | Performance Standard (Threshold) | Acceptable Quality Level (AQL) |
| Availability (POP-to POP) | Routine | 99.95% | ≥ 99.95% |
| Availability (SDP-to-SDP) | Routine | 99.5% | ≥ 99.5% |
| | Critical (Optional) | 99.95% | ≥ 99.95% |
| Time to Restore | With Dispatch | 8 hours | ≤ 8 hours |
| | Without Dispatch | 4 hours | ≤ 4 hours |
| Grade of Service (Call Blockage) | Routine | 0.07 (SDP-to-SDP) | ≤ 0.07 |
| | | 0.01 (POP-to-POP) | ≤ 0.01 |
| | Critical (Optional) | 0.01 (SDP-to-SDP & POP-to-POP) | ≤ 0.01 |
| Table 3.13-2 details the Level 3 Combined Services performance metrics. | | | |

### 3.13.3 PROPOSED SERVICE ENHANCEMENTS

Level 3 does not intend to exceed the AQLs in the KPIs at this time but would like to reserve the ability to do so with performance improvements that may be attained through the introduction of new technology. Level 3 believes in continuous improvement and will always strive to provide the highest quality, available services.

### 3.13.4 EXPERIENCE DELIVERING COMBINED SERVICES

Networx customers will benefit from having the Level (3) team as their partner for Combined Services in the same way many of the top companies in the US and Europe have benefited from their choice of Level 3 as their partner:

- CLEC status in all 50 states
- Network and telephone numbers in rate centers covering over 85% of U.S. households
- Over 1.7 million voice-capable trunks connect Level 3 to the PSTN
- Connectivity to every long distance tandem office in the United States
- Carry over 6 billion minutes of U.S. and international traffic every month
- 100% On-net Feature Group D (FGD) origination and termination capability
- First internationally deployed Softswitch for voice to VoIP conversion
- FCC-compliant E911 VoIP solution (3,517 rate centers; 5,463 PSAPs)

In summary, Level 3 is a world-class voice services provider, an innovator in delivery of voice services via IP, and Level 3 provides the inter-exchange underpinning for most U.S. ILEC's. Level 3 delivers high performance, high

reliability, and low cost voice services to large government and commercial enterprises worldwide.

### 3.13.5 ACCESS ARRANGEMENTS

As a competitive local exchange carrier (CLEC) in all 50 states, Level 3 has been very active in bringing our largest customers on-net. That is, building fiber optic access into our customer's facilities, to provide diversity, redundancy and lower cost services. Therefore, Level 3 will evaluate each site individually to determine the best business case to satisfy the customer and deliver the finest service possible.

If the site is already on-net, optical fiber will be in place connecting to a Level 3 POP, with appropriate termination equipment at each end. If the site is off-net, Level 3 will investigate the feasibility and cost involved to bring the site on-net versus the alternative access methods available. In consultation with the respective customer, a business case will be developed and the most appropriate access plan implemented.

To build access between the agency site and the Level 3 Network, we will investigate constructing new fiber routes, purchasing third party dark fiber, or leasing off-net connectivity from another service provider. In those cases where third party fiber is employed, industry-standard KPIs/AQLs will be required from the supplier so that industry best practices are supported.

Where fiber connectivity is not a viable option, Level 3 will, on the customer's behalf, lease services from another service provider.

The following diagram provides a high-level overview of the variety of access arrangements Level 3 has implemented for our customers:

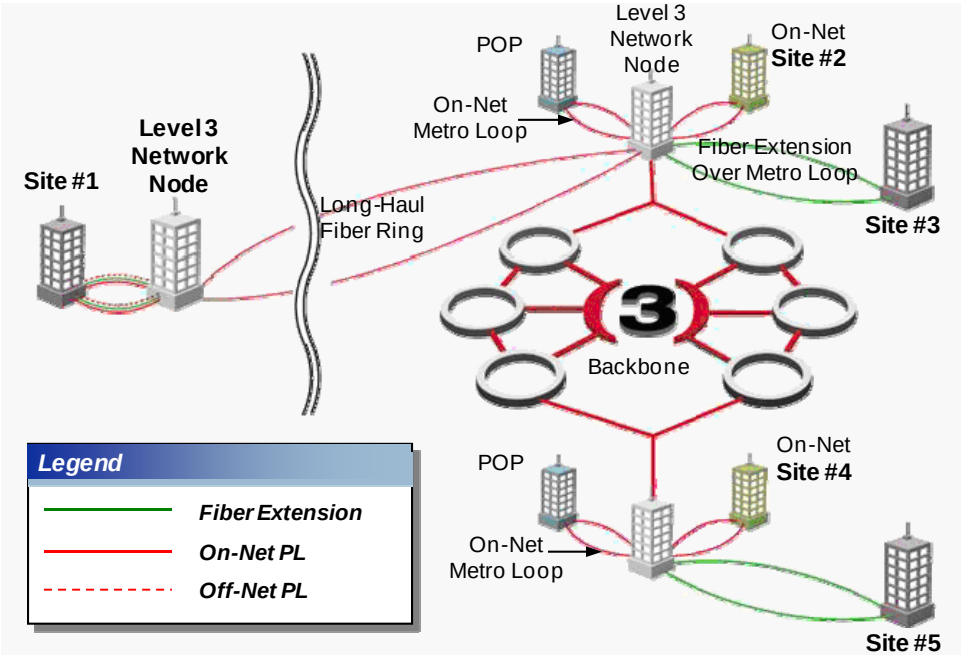


**Figure 3.13-3 Level 3 access arrangements are flexible and numerous sites can be connected in a variety of ways.**

### 3.13.6 MONITORING AND MEASURING KPIS AND AQLS

This section describes the Level 3 approach to ensuring compliance with the Government-specified Key Performance Indicators (KPIs) and Acceptable Quality Levels (AQLs) for Combined Services (CS) as defined in Table C.2.6.1.4.1, Combined Services Performance Metrics. In addition to collecting performance data, Level 3 will demonstrate to the Government that we are, in fact, performing within the specified KPIs/AQLs.

For the initial turn up of the circuit, a bit error rate (BER) test is performed end-to-end. If the test results are satisfactory, then the circuit is turned over to the Government. The KPIs for VS are measured over time in service of the circuit: availability and time to repair (TTR).

The Level 3 Transport Management Infrastructure and Operations Team is responsible for monitoring and managing our VS offering. Below is a summary of the specific tools used by our network management staff for comprehensive visibility of numerous network elements associated with VS and the ability to accurately measure AQLs for the applicable KPIs.

**Clarify:** Trouble ticketing system. All relevant alarm data including diagnostic network information is included in the body of the trouble ticket. The trouble ticket data is updated throughout the lifecycle of the event by the Level 3 Service Management Staff. Details, including all alarms and staff notes, are available for view on-line via our Enterprise portal.

**TrailBlazer:** The Level 3 user interface for service activation and for troubleshooting transport services.

**Ops Automation (OA):** A custom built application developed and used by Level 3 to automate network monitoring and management. The system monitors and manages all alarms received across the network through the Network Topology Viewer database (NTV). The Operations Automation engineering staff evaluates the alarms and correlates them to a customer's service using the object models created and maintained in TrailBlazer.

**Network Topological Viewer (NTV):** NTV is the single interface where all transport faults are aggregated and correlated to customer services. NTV shares information with our network configuration (TrailBlazer), Trouble-Ticketing (Clarify) and Operations Automation systems.

The KPIs measured for VS are described below.

- **Availability:** The percentage of minutes a customer's physical access port is able to send and/or receive traffic in a given month. Availability is determined in the following manner:

o Av = RI(HR) – COT (HR) x 100

RI(HR)

- **Unavailability:** Is calculated by the total number of minutes an access port is unable to send and/or receive traffic over the course of a month. Unavailable minutes are determined via trouble tickets submitted by the customer.
- **Time to Restore:** Level 3 measures the Time to Restore (TTR) as the customer-facing time to restore a problem. Our metric represents the gross internal performance of our service management teams. Specifically, the duration of an unexcused outage on a service port would be measured from the time a trouble ticket is opened to the time that service is restored.

Level 3 provides the Government an insight into the performance of Level 3's proposed Combined Services using web-based tools

### 3.13.7 HANDLING TIME-SENSITIVE TRAFFIC

Level 3 maintains Stratum-1 timing on all time division multiplexed (TDM) transport facilities to assure end-to-end timing is maintained across the facilities. Timing continuity is then monitored and verified by network operations staff in our network operations centers.

Our network operations and engineering teams maintain sufficient excess capacity to assure that even at the busy hour, network availability, call completion and blocking levels are well within desired levels. As traffic levels grow, additional resources are brought on-line to address the increasing demand.

### 3.13.8 INTEGRATED ACCESS FOR DIFFERENT PERFORMANCE REQUIREMENTS

Our approach for providing integrated access to locations that support customer applications with different performance requirements is described below.

Level 3 prefers to provide CS access over dedicated fiber links. Additional services can be provided over the fibers with additional equipment. Add-drop multiplexers (ADMs) with appropriate interfaces for the different services required by the Government will be deployed as necessary for the services ordered. Typically, different services will use different, distinct fiber strands, or different wavelengths on the same fibers, going to the site. Thus applications requiring different service and performance levels will not interfere with the high quality required for Level 3 Combined Services.

### 3.13.9 INFRASTRUCTURE ENHANCEMENTS AND EMERGING SERVICES

This section describes the approach for incorporating infrastructure enhancements and emerging services that Level 3 believes are likely to become commercially available in the timeframe covered by this acquisition, including a discussion of potential problems and solutions.

Level 3 is committed to providing all customers with access to the latest technology development and enhancements for both hardware and software. As customer requirements change, Level 3 will recommend modifications, or upgrades to existing facilities. After a thorough cost/benefit analysis, in consultation with the customer, Level 3 will develop a revised network design and transition plan. Only with the approval of the customer, will Level 3 make a network design change that could potentially impact the service level the customer is receiving.

The Level 3 account team is constantly reviewing the available technology and evaluating it's feasibility within the customer network. They will

periodically provide the customer with training on emerging technologies and explain how those technologies might improve the operational environment for the customer.

For example, when voice services customers are ready to consider migrating to the world-class Level 3 voice over IP (VoIP) services, their Level 3 account team will be prepared to assist them. Then a practical plan will be developed to assure a smooth transition, on the customer's timetable.

Changes to the Level 3 backbone network infrastructure are being made all of the time. While these changes are not entered into lightly, they are generally required to maintain Level 3's prominence in the telecommunications transport market – and to maintain the highest levels of performance and low cost that our customers have come to expect.

Permanently established architecture teams (Optical Transport, Data and IP, Voice) are constantly evaluating new hardware, software, and network designs for innovative features and economic advantage. Once something new demonstrates the potential for significant beneficial capabilities, performance improvements or major cost reductions, it is tested in our evaluation laboratory.

Level 3 has established an elaborate test facility at our corporate headquarters in Colorado for just this purpose. Only upon successful completion of evaluation and testing, and development and testing of implementation and transition plans, are changes to the infrastructure scheduled. Backbone network service events are scheduled for low volume periods, to avoid any chance that customer operations might be affected by the service event.

### 3.13.10 NETWORK CONVERGENCE

Level 3 is committed to provide customers networks with the highest performance and reliability possible. To deliver on this commitment Level 3 has constructed a thoroughly converged network.

During the design process, Level 3 Engineers evaluate the transport requirements to deliver the highest reliability and performance service to the customer, employing the network resources that will deliver the best cost/performance appropriate to the specific requirement. Where service over a converged network will provide the customer with improved service, lower cost, and/or improved flexibility, the Level 3 Engineer will specify those services.

As a general rule, lower bandwidth network transport requirements are better served over a converged infrastructure, while higher bandwidth requirements benefit from lower network complexity. However, Level 3 depends on the high quality of our customer focused engineering resources to make the ultimate determination, based on the best interests of the specific customer.

### 3.13.11 IP AND PSTN INTEROPERABILITY

IP and PSTN Interoperability is not applicable to our Combined Services (CS) offering.

### 3.13.12 IPV4-TO-IPV6 MIGRATION

IPv4-to-IPv6 migration is not applicable to our Combined Services (CS) offering.

### 3.13.13 NS/EP FUNCTIONAL REQUIREMENTS

Level 3's approach to satisfying the NS/EP basic functional requirements listed in the Networx RFP Section C.5.2.2.1.1 is described in detail in Section 2.5 of the original Networx Enterprise proposal.

### 3.13.14 PROTECTION OF SS7 SIGNALING

Section C.5.2.4 of the Networx RFP with respect to protection of SS7 signaling systems is addressed in detail in Section 2.1.2 of Level 3's original Networx proposal.

Security of our network, particularly the management and control infrastructure represented by the SS7 components, is of the utmost importance to Level 3 and is a constant focus of Level 3's network management and security organizations.

### 3.13.15 NATIONAL CAPITAL REGION SERVICE

Level 3's ability to provide service to Government customers during emergencies, such as national security and natural disaster events, is discussed in detail in Section 2.5 of our Networx original proposal submission. Protection of our signaling systems and assurance of coverage in our National Capital Regions is addressed in detail therein.

### 3.13.16 MEETING SECTION 508 PROVISIONS

Meeting Section 508 Provisions as specified in Section C.6.4 of the Networx RFP is addressed in detail in Section 2.5 of Level 3's original Networx proposal.

### 3.13.17 OPTIONAL SERVICES IMPACT ON NETWORK ARCHITECTURE

Voice services are part of Level 3's standard commercial offerings. Providing CS to the Government under Networx will have no adverse impacts on network architecture or performance.

### 3.13.18 OPTIMIZING ENGINEERING

Section 3.1.5.1 of Level 3's original Networx proposal discusses in detail the Level 3 approach for optimizing the engineering of IP-based and optical services.

### 3.13.19 SERVICE INTERNETWORKING

Level 3's vision for implementing service internetworking over a common infrastructure is not relevant to Combined Services. This topic is discussed in Volume 1, Section 3.1.5.4 of Level 3's original Networx proposal.

### 3.13.20 TRAFFIC MODEL

All Level 3 services use a common network. Therefore, traffic on Level 3's network considers all our proposed services. Traffic related to the Government traffic model and Level 3 is discussed in detail in Volume 1, Section 3.1.4.1 of Level 3's Networx original proposal.