

ASSIA DSL Expresse

1 Maximizing DSL Profitability

The ASSIA DSL Expresse® software product enables DSL operators to extend the rate and reach of their DSL systems while maximizing service quality and minimizing maintenance costs. DSL Expresse optimizes the operating parameters (“profile”) of each DSL line, and produces detailed line-level and network-level diagnostics for both the copper plant and DSL service. DSL Expresse is compatible with all standards-based DSLAMs and presently supports ADSL1, ADSL2/2+, and VDSL2. DSL Expresse is deployed on networks throughout the world and is scalable to networks of more than 15 million lines.

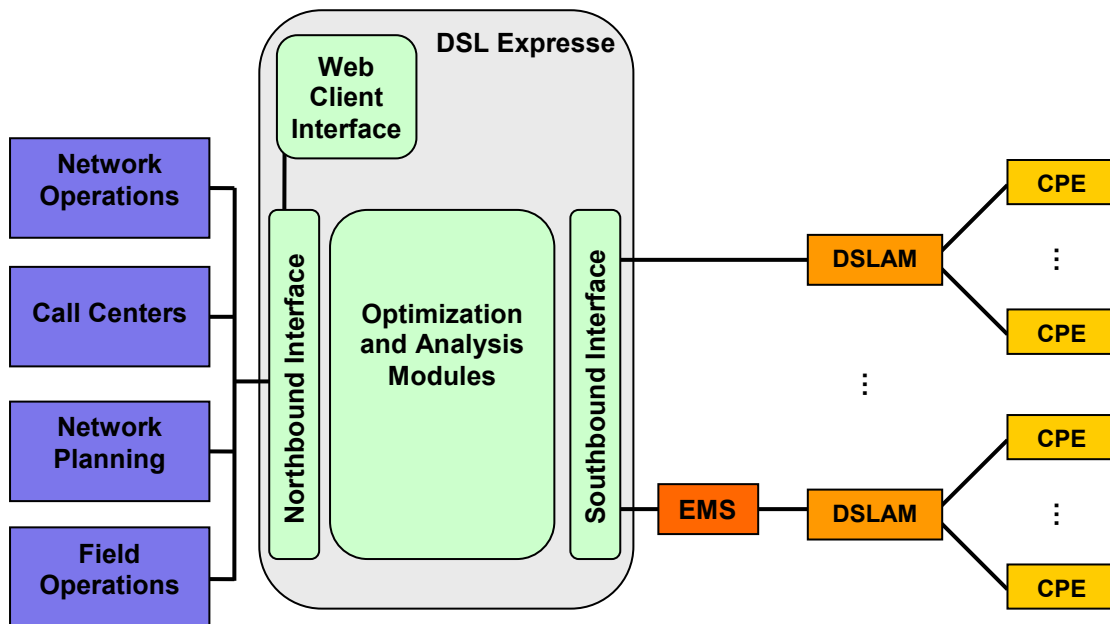


Figure 1. DSL Expresse Architecture

DSL Expresse’s Southbound interface supports SNMP, TL1, and other standard management languages for easy integration with all vendors’ DSLAMs and Element Management Systems (EMSs). An XML-based Web-services Northbound interface is provided for integration with other OSS systems. DSL Expresse also supports access to its diagnostic and management interfaces via standard Web browsers, enabling operators to derive immediate benefit with a minimum of integration effort.

2 DSL Expresse Functions

DSL Expresse’s functions can be divided into three principal areas.

- Automatic Re-profiling/Automatic Repair
- Diagnostics
- Service Recommender

Automatic Re-profiling and Automatic Repair

DSL profiles are complex and include many interacting factors such as power levels and margins, bit rates, interleaving, and forward error correction schemes. Operators have traditionally defined a limited number of profiles for their networks and applied them to their DSL lines manually using simple heuristics such as loop length. Each loop in the network is different, however, and the result of the traditional process is that lines are either under-provisioned in the sense of being programmed to a speed lower than what they can support or over-provisioned in the sense of being programmed to a speed higher than what they can stably support. Under-provisioned lines lead to lost revenue opportunities for higher-speed services or for applications such as IPTV. Over-provisioned lines lead to higher maintenance costs from customer complaints.

Based on the DSL operator's service tiers and quality-of-service targets, DSL Express automatically configures all lines in the network for their highest possible stable speed. DSL Express is run proactively on all lines in an operator's network on a weekly or more frequent basis. It can also be run reactively in the case of newly provisioned lines or at the request of technical or customer support personnel.

Figure 2 shows the results of automatic re-profiling in a commercial network with ADSL1 and ADSL2/2+ equipment. Downstream rates are shown on the left of the figure. Stability appears on the right, characterized by a combination of code violations in a 15-minute period, and modem retrains in a 12-hour period. The light and dark blue stability categories are suitable for IPTV. DSL Express increased the fraction of users that could receive speeds in excess of 10 Mbps from roughly 5% of the network to nearly 60% of the network. At the same time, the fraction of users with poor quality IPTV services was reduced by nearly 75%, from 37% of the network to 9% of the network.

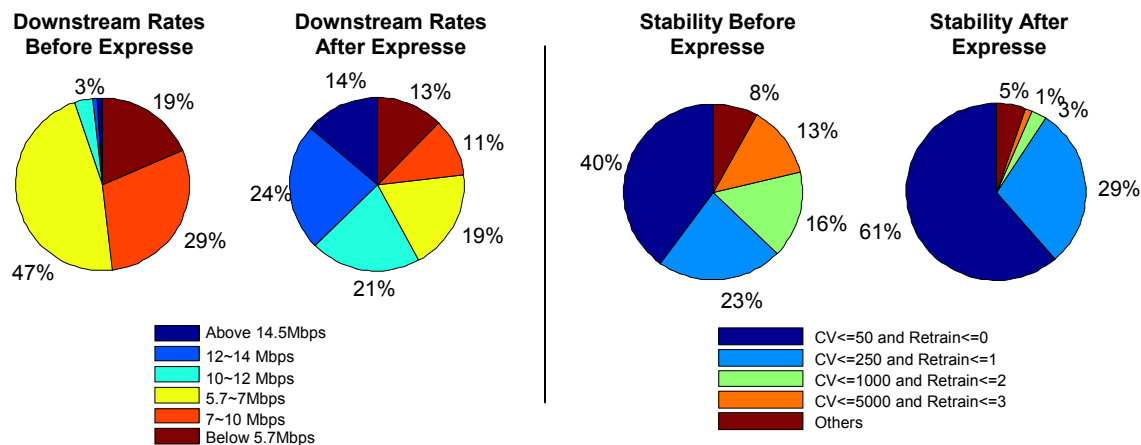


Figure 2. DSL Express Automatic Re-profiling Results

Diagnostics

DSL Express analyzes the data collected from the DSLAMs and EMSs to produce powerful and unique diagnostics of DSL and physical layer performance. These diagnostics enable customer care and technical staff to be more efficient in their work, significantly reducing the number of steps required to restore service, and eliminating or reducing expensive technician visits through improved problem localization. DSL Express's powerful neighborhood analysis feature quickly separates customer premises problems from outside plant problems, enabling DSL operators to dispatch the correct repair personnel and also to proactively plan plant upgrade or repair services. Unlike SELT and other diagnostic approaches, DSL Express diagnostics do not interrupt the customer's DSL service.

Loop Diagnostics	Noise Analysis	Connection Statistics	Network Performance
✓ Loop Length	✓ DSL Crosstalk	✓ Maximum Data Rate	✓ Rate, QoS Analyses
✓ Bridged Taps	✓ AM Noise	✓ Code Violation Rates	✓ Vendor Comparisons
✓ Bad Splice	✓ T1/E1 Crosstalk	✓ Retrain Rates	✓ Neighborhood Analysis
✓ MABR after Removal of Impairment	✓ ISDN Crosstalk	✓ Power and Margins	

Table 1. DSL Expresse Diagnostics (partial list)

DSL Expresse diagnostics are easily accessible by all authorized operator personnel using standard Web browsers such as Firefox® or Internet Explorer®¹ via the Web client interface.

DSL Expresse's Northbound interface provides a standard XML-based mechanism for distributing its diagnostic data to other OSS systems.

Service Recommender

Using the DSL operator's service tiers, the Service Recommender analyzes the characteristics of all DSL lines in the network to identify the lines that can support a higher level of service than that for which they are currently provisioned (and hence produce higher ARPU). The Service Recommender enables the operator to target the marketing of new service offerings to customers whose lines can sustain the higher grade of service, improving return on marketing and sales costs. Service Recommender results can be viewed with a Web browser or accessed through OSS or BSS systems via the DSL Expresse Northbound interface.

DSL Expresse Value Proposition

DSL Expresse improves the economics of DSL operations. Revenues are improved from reductions in churn and increased market opportunities for higher-tier services. Operating costs are reduced by extended DSLAM reach, by automated repair/re-profiling of DSL lines, by improved efficiency of customer care operations, and by an improved ability to manage vendor relationships by virtue of the network-level analysis performed by DSL Expresse. Capital costs are reduced through extensions in the DSLAM rate/reach curve.

The improvements that will be seen by any particular operator will depend on the details of the operator's business and network. ASSIA routinely works with operators to develop economic analyses of Expresse tailored to a particular network or business model. Operators can arrange for trials of DSL Expresse in their network for direct assessment of the product's benefits to their business.

¹ Firefox is a trademark of the Mozilla Foundation. Internet Explorer is a trademark of Microsoft Corporation.



For Further Information

For further information on DSL Expresse including product details, trial, and deployment alternatives, please contact ASSIA, Inc.

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