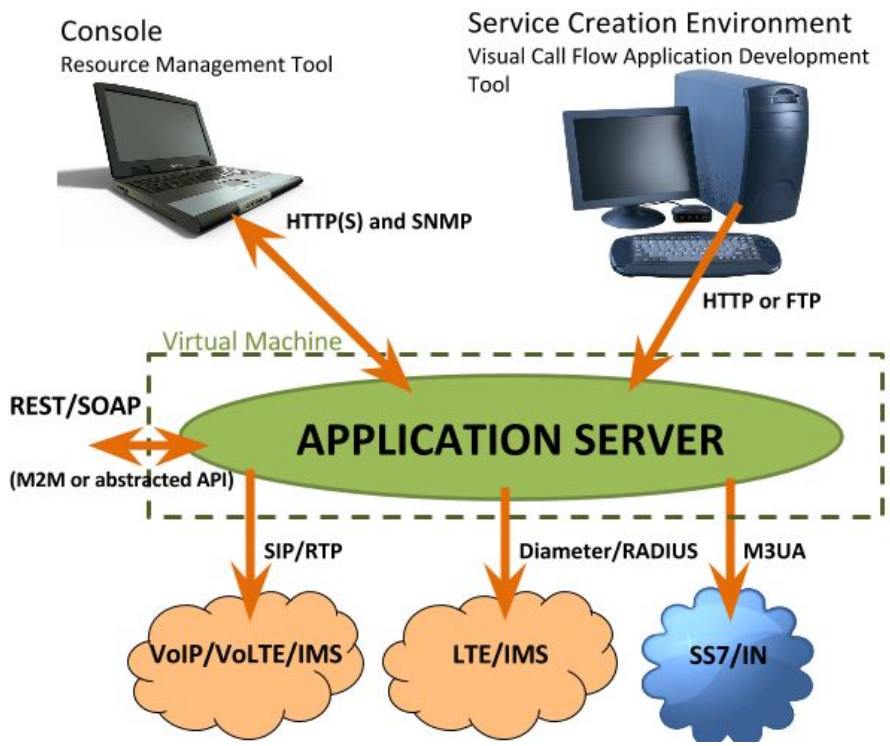
XpressWorkX™ Application Server

A Complete Services Deployment Environment

Highlights:

- **Scalable platforms to cost effectively meet any network requirements**
- **High availability to protect service related revenues**
- **Designed to open standards**
- **Distributed call processing and load balancing**
- **Centralized management easing OA&M requirements**
- **Built in soft media server**



IMSWorkX, Inc. brings you superior voice services using our flagship product, the XpressWorkX™ Application Server. This platform offers rapid customization and adaptation of existing applications as well as the ease and flexibility of creating new applications; all of which can be built and delivered reliably across a wide variety of networks including IMS, VoIP, VoLTE, VoWifi, IN, GSM, CDMA and converged TDM/IP.

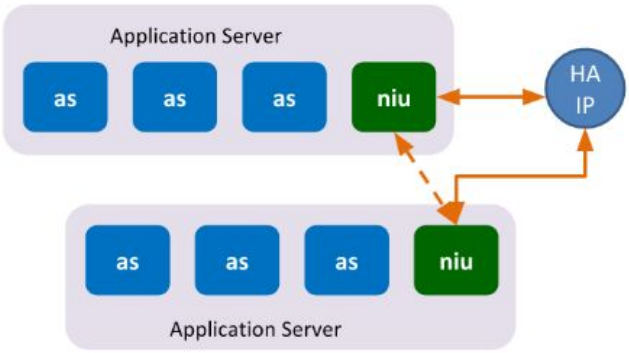
Flexible Architecture for Every Network

The robust architecture, and use of next generation network standards, provide a multi-service deployment environment with marked flexibility and scalability. Instead of relying on costly single application platforms, you can deliver multiple SIP or AIN-based services starting with a single XpressWorkX Application Server. A 2x2x4 virtual machine (dual vCore, 2 GHz processor, 4GB memory) provides up to 1,200 active sessions (application dependent). When you are ready, the XpressWorkX Application Server distributed call processing and load balancing lets you rapidly add or modify services as needed with no service interruption.

IMSWorkX, Inc.

sales@imsworkx.com
www.imsworkx.com

High Availability Cluster
Paired Instances for Redundant Deployment



The application server is a cluster of machines that work together to serve network applications to the clients. The server communicates with several network peers in order to best serve the intended clients.

The server consists of several machines (usually a minimum of 3) that can be either physical hardware servers or virtual machines. The first machine in the Application Server is the Network interface Unit (NIU). The NIU is the machine that has the public IP address for external communication. All calls that come into the server are first received by the NIU.

The remaining machines in the server are Application-Processing Servers (AS). These machines actually process the calls by executing the service logic for the applications that are running and performing all the call treatments. Each AS contains an embedded media server so it can act as an endpoint during the call to play or receive media. This feature is useful for IVR applications, collecting digits, and call recording. The AS contains the session and media licenses so the actually call session state machine is maintained in these machines

Call Handling for High Availability Demands

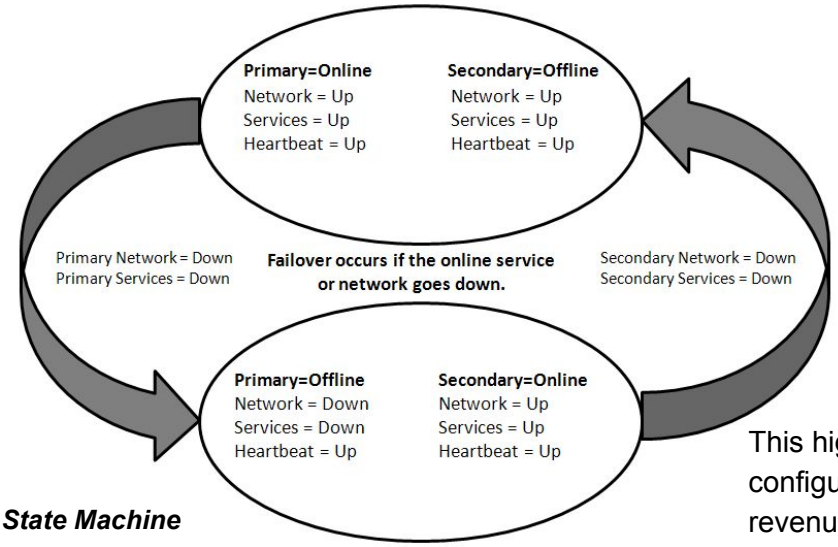
The Network Interface Unit allows distribution of call processing across many Application-processing Servers in an N+1 configuration within a cluster. This high availability cluster can be co-located or distributed across an IP network. For Redundancy, the NIU can be paired in an active/standby configuration.

For load balancing, the NIU directs calls to the least busy AS in the cluster. This load balancing enables a single service access point to the Application Server cluster that can scale from a very small network to one that supports millions of subscribers. All AS within the cluster are always active.

Failovers

When the active NIU goes down, a failover automatically switches all incoming traffic to the standby NIU. The following situations can cause a failover:

- network is determined to be down by the online NIU
- there is a critical process crash on the online NIU
- online NIU goes offline



Failover State Machine

This high availability configuration ensures that revenue generating services stay running under any failure scenario.

Based on Industry Standards

Compliance with and the use of industry standards ensures that the XpressWorkX Application Server is easily integrated into VoIP, VoLTE, IMS, and converged networks. This adherence to industry standards guarantees that the IMSWorkX portfolio of applications stays current with the ever evolving nature of next generation network architecture and specifications.

Internet Engineering Task Force (IETF)

- RFC 3261 – Session Initiation Protocol (SIP)
- RFC 3264 – An Offer/Answer Model with the Session
- RFC 2327 – Session Description Protocol (SDP)
- RFC 3262 – Reliability of Provisional Responses in SIP
- RFC 2976 – SIP INFO Method
- RFC 3265 – SIP-Specific Event Notification (not fully compliant)
- RFC 3515 – SIP Refer method
- RFC 3892 – SIP Referred-By Mechanism
- RFC 3891 – SIP "Replaces" Header
- RFC 3842 – Message Summary and Message Waiting Indication Event Package for SIP
- RFC 2806 – tel URI for Telephony Calls
- RFC 3389 – Real-time Transport Protocol (RTP) Payload for Comfort Noise (CN)
- RFC 3665 – SIP Basic Call Flow Examples
- RFC 2045/46 – Multipurpose Internet Mail Extensions (MIME) Parts One and Two
- RFC 2396 – Uniform Resource Identifiers (URI):Generic Syntax
- RFC 1889 – RTP: Transport Protocol for RealTime Applications
- RFC 3666 – SIP PSTN Call Flows
- RFC 2617 – HTTP Authentication: Basic and Digest Access Authentication
- RFC 2833 – RTP Payload for DTMF Digits,Telephony Tones and Telephony Signals
- RFC 3550 – RTP: Transport Protocol for Real-Time Applications
- RFC 3489 – STUN - Simple Traversal of UDP through Network Address Translators
- RFC 3323 – Privacy Mechanism for SIP
- RFC 3863 – Presence Information Data Format (PIDF)

MS-specific SIP Standards Compliance

- RFC 3325 – Private Extensions to SIP for Asserted Identity within Trusted Networks
- RFC 3311 – SIP UPDATE Method
- RFC 3312 – Integration of Resource Management and Session Invitation Protocol
- RFC 3891 – SIP "Replaces" Header
- RFC 4032 – Update to SIP Preconditions Framework
- RFC 3986 – Uniform Resource Identifier (URI): Generic Syntax
- RFC 4004/05/06 – Diameter: proper handling of vendor-specific applications and AVPs

3GPP Technical Specifications

- IMS sh interface for subscriber information - 3GPP TS 29.329 (Sh interface)
- IMS rf interface for offline charging - 3GPP TS 32.260 (Ro/Rf charging)
- IMS ISC interface for session control
  - 3GPP TS 24.228 (core signaling)
  - 3GPP TS 24.229 (IMS call control)
- IMS Multimedia Telephony Service and supplementary services - 3GPP TS 22.173 version 12.7.0 Release 12

IN Technical Specifications

- GR-1299 AINGR for switch-Service Control Point (SCP)/adjunct interface information
- GR-1188 LSSGR: CLASS℠ Feature: Calling Name Delivery Generic Requirements
- GR-533 LSSGR: Database Services Service Switching Points – Toll-Free Service

Network Performance Measures

The XpressWorkX Service Delivery Platform is an IMS/Next Generation Telephony network device. To maintain call quality, the following minimum network performance measures must be met:

- end-to-end, one-way latency does not exceed 100ms
- jitter does not exceed 20ms
- packet loss is less than 0.5%

IMSWorkX recommends that you use QoS to grant VoIP traffic the highest priority and thus minimize the network's impact on voice quality. An MPLS-based network is also recommended.

Software Product Distribution

The XpressWorkX Application Server is a software-only platform that is provided as an installable .rpm file and is built for machines (physical or virtual) with the Red Hat Enterprise Linux 6.x or CentOS 6.x (32 or 64 bit) operating system. The platform software takes advantage of other services in the operating system including Tomcat and Apache. Application services executing as part of the XpressWorkX Application Server take advantage of direct Java and JDBC interfaces to integrate with PostgreSQL, as well as other database engines.

Complete Voice Service Solution

IMSWorkX provides powerful service layer applications for VoIP, VoLTE, IMS and Converged IP/TDM networks that are flexible to meet the needs of any network and subscriber. The highly scalable XpressWorkX software platform brings added value to service providers because of its proven ability to provide current services on legacy networks while simultaneously allowing rapid development of new services for evolving networks.

IMSWorkX, Inc.
Corporate Headquarters:
3495 Winton Place, Building E Suite 100, Rochester NY, 14623|USA|+1 585 568 7155
European Headquarters:
Crendon House Crendon Park, Long Crendon HP18 9BB|UK|+44 7748 636116

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