

PacketUnity 5.0

Turn-Key VoIP Platform for ITSPs

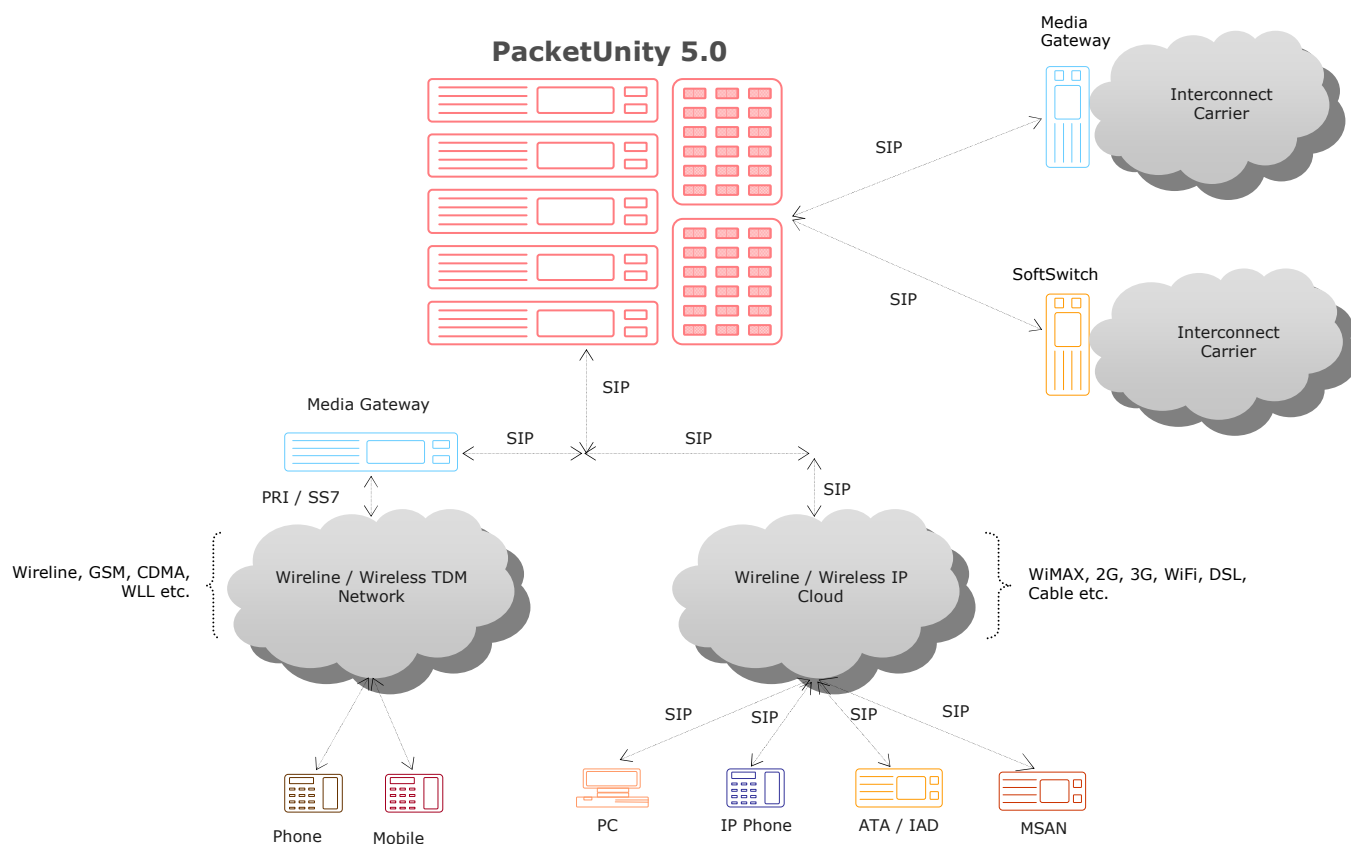
INTRODUCTION

PacketUnity 5.0 is an ITSP Grade and Turn-Key VoIP Infrastructure for Emerging Service Providers. Service Providers use its open and scalable architecture to provide customizable telecom solutions to their customers. The Platform can scale to 5,000 concurrent calls. Some of the services that can be rolled out of this platform are:

1. Wholesale VoIP Solution
2. Retail Net Telephony
3. International Call Back
4. VoIP Calling Card
5. Voice over Broadband Solution

SOLUTION SCHEMATIC

PacketUnity 5.0 is a multi service platform and is access network agnostic. Subscribers can initiate calls from any network, be it Wireline, Wireless or Broadband. The following diagram illustrates the deployment of PacketUnity 5.0 for subscribers calling from PSTN or VoIP Devices.

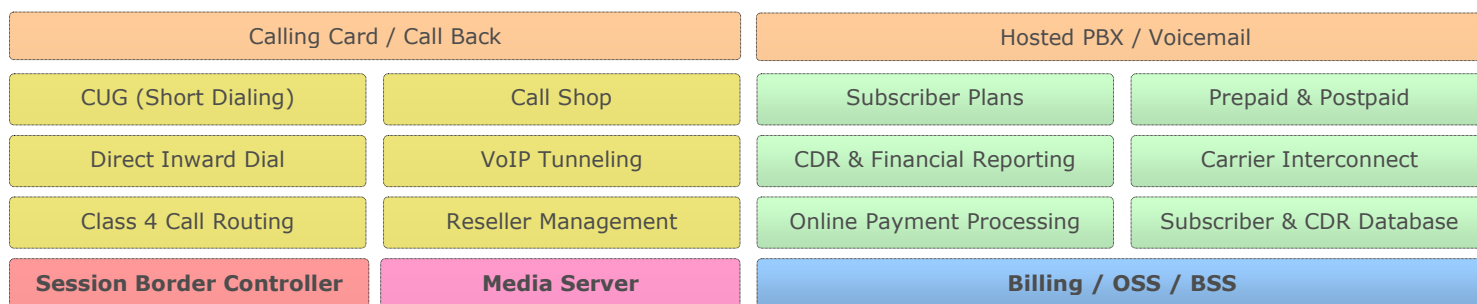


SOLUTION BENEFITS

1. Lower Total Cost of Ownership : Solution runs on industry standard Intel-Linux-JBOSS-PostgreSQL combination.
2. Easy to Install, Configure and Manage : Browser based system allows you to easily configure and operate.
3. Strong Reseller Management : Helps in partitioning the system for multiple White Label Resellers for quick ROI.
4. Rapid Time to Market : The solution is pre-integrated, tested & field proven with large operators.
5. Low Cost Customization : Helps the Service Providers in fine-tuning the solution at very affordable rates.

PLATFORM SPECIFICATIONS

PacketUnity 5.0 is a converged multi-service applications platform which provides a host of innovative, revenue generating applications to Service Providers. A software based communications platform, it runs on robust industry standard Linux hardware servers and comprises of various elements which are pre-integrated and serve specific functions as below:



CORE APPLICATIONS

1. Session Border Controller (Signaling & Routing)

- A. Protocol Support
 - a. SIP RFC 3261
 - b. Support for Re-INVITE, PRACK, REFER
- B. Border Control Features
 - a. Stateful Session Control
 - i. Call authorization by IP address or user name and password
 - ii. Maximum Calls Allowed from / to a Carrier partner.
 - b. Option of Full Proxy or Session Proxy Mode, on a case by case basis.
 - c. Masking of RTP Traffic IP addresses
- C. Media Proxy (NAT Traversal & Topology Hiding)
 - a. Media Proxy can authenticate devices behind Symmetric NAT and provide a channel to transfer voice packets.
 - b. Provides dynamic channel and resource allocation mechanisms that allow for improved security of the network, making it impossible for intruders to find a way into the network under the disguise of an authorized channel.
- D. Switch Partitioning for Multi-Layer Partition Groups with Access Control and different user privileges.
- E. Provisioning Features:
 - a. End-to-end Real time Call tracing Capability
 - b. Dynamic Modifications of configuration settings during Operations
 - c. Real-time provisioning of Routes and Calling Plans through a web based Interface
 - i. Unlimited Routing Tables
 - ii. Multiple Numbering Plans – International, National, Local
 - iii. Carrier Identification Code (CIC)
 - d. Number Translation
 - i. N-digit subscriber numbers
 - ii. Short / Prefixed number dialing for local / long-distance calls
 - iii. Support for Multiple Aliases
 - iv. Source / Destination number translation as required by different carriers
 - v. Source Number Disguise
- F. T.38 Fax (Group 3 and Group 4) pass-through
- G. Auto Inband / Outband DTMF over IP
- H. Automatic Call Distribution (ACD): Simultaneous, Round-robin or Sequential Manner
- I. Interoperable with large number of Media Gateways, IADs, IP Phones, VoIP Adaptors and Softphones.

2. Advanced Class 4 Call Routing

PacketUnity 5.0 provides advanced Call Routing Algorithms for Carrier Interconnects. These include:

- A. Least Cost Routing (LCR)

- B. Loss Less LCR
- C. Destination based Routing
- D. Preferred Routing
- E. Prefix / Suffix based Routing
- F. Gateway / Route Capacity based Routing
- G. Profit based Routing
- H. Percentage Based Routing
- I. Source Based Routing – Routing specific to User or Group
- J. Private / Public ENUM Registry Lookup

3. Media Server (IVR)

- A. Control Protocols
 - a. SIP, VXML / HTTP
- B. Specifications
 - a. VXML 2.0 Platform for IVR
 - b. DTMF Support through SIP INFO and RFC 2833
 - c. RTP / RTCP Support
 - d. Pass-through Codec Support: G.711, G.723, G.729a, G.729b, G.729ab
 - e. Intelligent Selection of Codec-based announcements
 - f. File Media Handling: Playing & Recording
 - g. Audio Packet Forking, Switching and Replication
 - h. Tool to convert .wav files into G.711, G.723 & G.729 codec files for announcements
 - i. Local Storage of Media Files
 - j. Multiple Language Support

4. VoIP Billing / OSS / BSS

- A. Subscriber Plans
- B. The Subscriber Plan includes recurring / onetime Charges, metered usage charges, surcharges and taxes. Multiple subscriber plans with billing and payment terms can be managed.
 - a. Real-time Tariff Management capabilities
 - i. Time of day / Day of Week / Special days of the Year
 - ii. Destination based Billing
 - iii. User Group
 - iv. Flat Rate Billing : Monthly / Fortnightly / Any Period
 - v. Pulse Customization
 - vi. Stepwise Reduction on every pulse / every time-period during the call
 - vii. Billing based on a hierarchy of subscribers: user, group, parent group, etc.
 - b. Custom Charges: Setup Fee, Monthly Fee, DID Charges etc.
 - c. Surcharges: Percentage or Flat Fee based
 - d. Taxation: Percentage Rate / Flat Rate
- C. Prepaid Capability
 - a. Prepaid Renewable
 - i. Capability to handle Multiple active PINs
 - ii. Real-time activation of the service at the moment of PIN acknowledgement
 - iii. Least Cost PIN chosen based on destination for every call
 - iv. User based activation / deactivation of the PINs
 - v. The Group owners can credit / debit amounts to / from sub-groups or users.
 - vi. Real-time rate plan switching (when PINs with different rate plans are available and if the Least Cost pin amount expires then the ongoing call will be charged based on the next available PINs rate plan)
 - vii. Recharge with or without rate plan change
 - viii. Top-Up, Recharge without changing the rate plan
 - b. Prepaid Non-Renewable
 - i. Non-mapped subscriber. Anonymous Users Possible.
 - c. PIN Administration

- i. Batch Creation: Generation of PINS in multiple denominations
 - ii. Association of PIN Patterns with Billing Plans
 - iii. Configurable Service Period, Grace Period and PIN Life
 - d. Active Call Monitoring & Snapping based on;
 - i. Safe Amount Margin
 - ii. Percentage Margin
 - iii. Device inactivity
- D. Real Time Billing
 - a. Real-time Billing and Balance Update
 - b. Simultaneous calls with different Rate plans are allowed and balances are Updated by considering usage of all the calls
 - c. When balance exhausts, only the call for which the permitted time expires is snapped, allowing other authorized calls to continue till the expiry of their permitted time.
 - d. Balance amount is dynamically updated if any of the call gets terminated before the allowed permitted time.
 - e. Real-time checking of Group account balance, and snapping all the calls if the Group does not have enough balance, applicable hierarchically for all the groups.
- E. Postpaid Capability
 - a. Subscribers / Groups billing on periodic basis
 - b. Periodic Invoice Generation
 - i. Customize billing cycles
 - ii. Line items can be grouped based on charge types
 - iii. Summary of all charges during the billing period
 - iv. Support for custom invoice messages to the end user
 - v. Invoices in PDF Format
 - vi. Emailing of Invoices to subscribers
 - c. Call Snapping on the subscriber / Group reaching Credit Limit.
- F. Carrier Billing Provisioning
 - a. Wholesale Tariff Management
 - b. The Wholesale Tariff Management functionality allows system providers to maintain a single nomenclature of destination prefixes and names used in the platform. Real-time population / Modification of the Destinations nomenclature on tariff uploads are supported for billing and reporting consistency.
 - c. Multiple Endpoint Support - Gateway / SoftSwitch
 - d. Application of Billing plans to every endpoint of a Carrier
 - e. Individual Credit Limits for every endpoint.
 - f. Source and destination carrier-based billing and reporting
 - g. Summary report of all the endpoints of a carrier
- G. Subscriber Authentication System
 - a. Multi-level user authentication
 - b. Preservation of User Profile, service options & Rights along with Account Balances.
 - c. Every subscriber has two sets of identifications: User ID/ Password and Telephone Id / TPIN Number
 - d. Subscriber Authentication on Softphones / IP Devices
 - e. Domain based authentication and supports unlimited number of domains
 - f. Subscriber specific enabling / disabling of originating calls from different CPE's simultaneously
 - g. IVR Access authorized on the basis of Numeric Identifications of the Subscriber
 - h. Access to specific services based on currently subscribed and active services
- H. Subscriber Self-Provisioning Features:
 - a. Complete & elaborate Call Logs
 - b. Search & locate recent calls by number, time period and billing cycle.
 - c. User Profile Updation: Name, Address, Password, Billing, Shipping and Payment information.
 - d. Alteration and change of calling plans
 - e. Addition of virtual numbers and additional lines.
 - f. Viewing of past bills
- I. Administrator Provisioning Features:
 - a. Subscribers: create, modify and delete profile

- b. Groups: create, modify & delete user profiles based on access control

5. Roles & Privileges

- A. Role based Access Control
- B. System Administrators can Create & Assign Access Privileges to system users
- C. Ability to create users in multiple roles (Customer Support, Technical Support, MIS, Reseller, Administrator)
- D. Selective rights enabling / disabling for a specific user

6. Reseller Partitioning / Private Labeled Agent Management

- A. Service Provider can create unlimited number of resellers who in turn can create unlimited number of sub resellers.
- B. Service Providers can create customized billing plans for charging resellers.
- C. Resellers can create their own billing plans (Prepaid & Postpaid).
- D. Resellers can provision their own set of subscribers and create a subscriber – service - billing plan matrix.

7. Direct Inward Dial Facility

- A. DID facility allows the Service Providers to map PSTN numbers directly to IP Endpoints / SoftSwitches / Media Gateways.
- B. This enables the subscribers to have a virtual phone presence in choice of areas with call termination on an IP endpoint anywhere in the world.
- C. The Service Provider can buy these virtual numbers in wholesale and retail them to subscribers either in small bulks or individually. Services like Virtual Presence in a different country / city and toll free inbound access can be given out by using this facility.
- D. Unlimited number of DIDs can be mapped to a subscriber.

8. CUG (Short Dialing) Facility

Closed User Group (CUG) system allows formation of a group of subscribers who can internally communicate amongst themselves. They could use a 3-digit/4-digit dialing to address group members. There could be multiple other services which can be rolled out specifically for CUGs. For calling outside the CUG or for Inter-CUG calling, there is an escape Prefix that is configured with every CUG.

9. Call Shop Facility

- A. Call Shops are treated as Resellers with a rate sheet assigned by the Service Provider / Master Reseller as cost to them.
- B. Call Shop owners can create their own rate plans and bill the walk-in customers.
- C. Web based reports on completed calls are available to the Call Shop owners on the basis of which they can create invoices and charge the customers.
- D. Call Shop owners can bill each IP Phone / Port of ATA in their Call Shop as a different number.
- E. Call Shop booths can be created with user friendly names with different rate plans.
- F. Call Shop booths account will get recharged as and when the user pays for the usage and hence the booth account will not get expired.

10. Online Payment Gateway Integration

- A. Subscribers can also make payments online by utilizing this service.
- B. This service has secure order pages and provides a convenient way to transact through various Payment Gateways.
- C. Some of these Payment Gateways (integration required) are Moneybookers, Paypal & Authorize.net

11. Web Based Provisioning & Reporting

- A. Administrators can generate Call Statistics and Analyze them for:
 - a. Real-time monitoring of QoS (ASR, ACD etc.)
 - b. Call statistics (Traffic volume, Revenue & Cost) monitoring by Destination / Carrier / Subscriber
 - c. Trend Reports based on Total Calls / Carriers / Revenue / Profit / Cost / ASR / ACD etc.
- B. Resellers / Subscribers can generate Call patterns and Usage Reports based on:
 - a. User / Group / Reseller / Source / Destination
- C. System Log files based on configured log levels are generated for a specific period of monitoring.

OPTIONAL APPLICATIONS

1. Prepaid Calling Card Facility

Prepaid Calling Card Service includes the following features:

- A. Multiple Service provider support with customizable access numbers, prompts and languages.
- B. All IVR pages can be customized to add home menu, post PIN and post destination number dial prompts e.g.:
 - a. Calling Card Balance at the beginning of the call.
 - b. Maximum Call duration based on destination dialed
 - c. Recharge by PIN
- C. Subscribers can initiate a new call at the end of the first call by pressing a # key.
- D. Multiple callers using the same PIN cannot call simultaneously in order to prevent misuse.
- E. Service Providers can introduce call restrictions based on parameters chosen like dialed number.
- F. Service Providers can introduce charge for using the IVR prompts alone if the subscriber does not complete a billable call.
- G. Service providers can enable Prepaid Calling in 2 different forms:
 - a. PIN based: Using these cards, the subscriber can call from any of the phones associated with the Service Provider into an IVR and then get authenticated using his/her password. In this case, the phone does not get billed; the charges are passed on to the PIN.
 - b. PIN Less: PINs can be associated with a specific telephone number. When a subscriber makes a call, the system captures the CLI, authorizes it and prompts the subscriber to dial the destination number.

2. ANI / Web based Callback Facility

In a callback facility, the subscriber informs the system of the origination and termination numbers through a web interface or by calling into a Callback Prompt followed by the destination number where the origination number CLI is noted. The system then initiates a call to the destination and the origination numbers and connects both of them. The following are the ways through which the subscribers can initiate a Callback:

- A. Using a Phone:
 - a. Through a PIN: The subscriber calls the system. The System notes the CLI and calls back the caller, prompts for the authentication PIN. Upon authentication of a valid subscriber, the system prompts the caller for the destination number and connects the Caller and Callee.
 - b. Through ANI: The subscriber calls the system. The System notes the CLI, authorizes it and calls back with a prompt for the destination number. Upon dialing the destination number, the system connects the Caller and the Callee. Subscribers can add multiple ANI Numbers to their account,
 - c. Through DID Number: In case the Caller ID is blocked, the subscribers can call a DID number associated with their account. The system calls back a predefined number associated with the DID number and prompts the caller for the destination number. Upon dialing the destination number, the system connects the Caller and the Callee.
- B. Using Web:
 - a. The subscriber comes to the Service Provider website and gets authenticated through his/her User Id / password. The subscriber then provides the destination number on the same webpage. The system calls both Caller and Callee and connects both of them.
 - b. This Facility can also be used for providing Click-2-Talk service to Enterprise customers. While browsing, a potential customer can click on a TALK button on a website to initiate a call to Sales / Support representative of an enterprise. The system collects the customer's phone number and initiates a call-back to this and the enterprise number.
 - c. Subscribers can schedule the Call Back using the web based interface.

3. Hosted PBX

Service Providers utilize the Hosted PBX Features to offer Voice over Broadband Services to Residential & SMB Subscribers who are looking for a cost-effective communications solution.

- | | | |
|----------------------|------------------------|-----------------|
| A. Caller ID / Name, | J. Find Me - Follow Me | N. Call Barring |
| B. Caller ID Block | K. Call Forward | O. Call Block |

- | | | |
|-------------------------|----------------------|---|
| C. Anonymous Call Block | a. Every time | P. Redial |
| D. Call Hold | b. On Busy | Q. Last Number Redial |
| E. Music on Hold | c. On No Answer | R. Speed Dial |
| F. Call Waiting | L. Call Transfer | S. Short Number Dialing |
| G. Absent Subscriber | a. Attended | T. 3-Way-Calling (Device Feature) |
| H. Do Not Disturb (DND) | b. Unattended | U. Mapping of a single number on multiple phones. |
| I. Call Return | M. Simultaneous Ring | |

4. Voicemail

The Voicemail Facility provides storage and retrieval of voicemails on both Phones and PCs. The subscriber can activate / deactivate the service either through the Subscriber Self Provisioning Portal or through the Phone.

- A. Each Voicemail account is password protected.
- B. The subscriber can provision incoming calls to voicemail on various parameters :
 - a. On Busy / Not Available / Unconditional (always)
- C. The subscriber can record personalized greeting(s) which will be played when accessed.
- D. The subscribers can listen to / reply / delete / repeat / skip voicemails using the phone/subscriber portal.
- E. Maximum Voicemail duration is configurable.
- F. Administrator can configure the total size of the voice inbox for different subscribers.
- G. Subscribers can configure their voicemail as an Information Only Mailbox (Voice Portal) which plays the prerecorded message when accessed.

SYSTEM ARCHITECTURE & PERFORMANCE

- | | |
|-------------------------|---|
| 1. Maximum Capacity | 5,000 Concurrent Calls |
| 2. Hardware Requirement | - 2 * Quad Core Xeon 3.0 GHz Processor, 8 GB RAM, 2 * 140 GB SAS HDD
- Multiple Servers of above configuration based on Capacity & Services Planned. |
| 3. Operating System: | Linux (Fedora / Enterprise Linux / CentOS) |
| 4. Application Server: | JBOSS |
| 5. Database: | PostgreSQL |

ABOUT NEXGE

Nexge is based out of India and provides diverse range of NGN / VoIP based Telecom Solutions to Service Providers globally. Nexge has an installation base of its solutions with more than 75 Large and Medium size operators globally.

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