OpenSIPS Summit - Keynotes

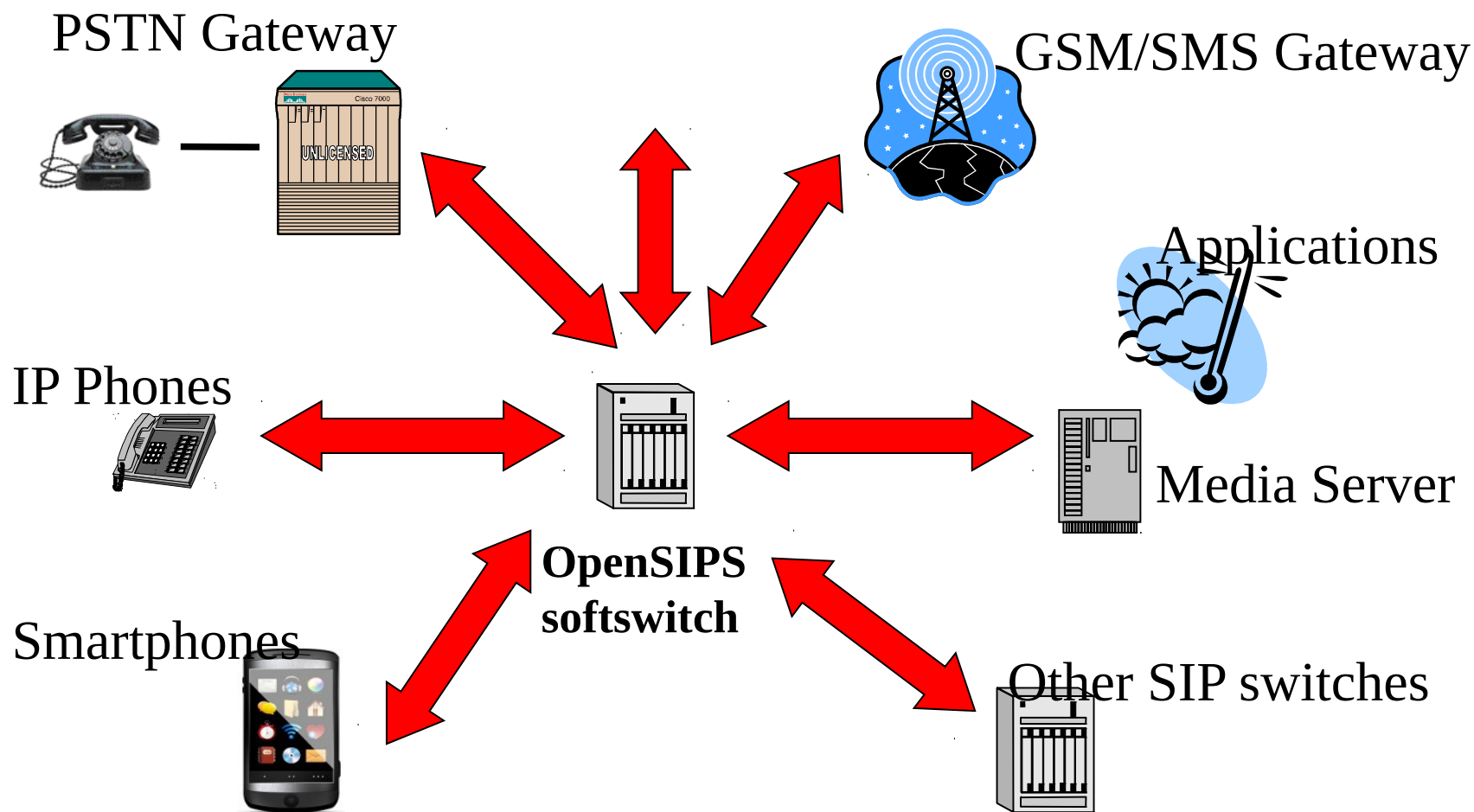**Bogdan-Andrei Iancu**
Founder OpenSIPS Project
OpenSIPS Solutions

About OpenSIPS

What OpenSIPS is ?

- primarily a SIP proxy

- multi purpose proxy

- doing voice, video, presence, IM and other

- signaling only, no media

PSTN Gateway

GSM/SMS Gateway

Applications

IP Phones

OpenSIPS softswitch

Media Server

Smartphones

Other SIP switches

Why OpenSIPS ?

- High throughput (calls, cps, registrations)

- Flexibility for routing and integration

- Effective application building (134 modules)

More reasons ?

- Traffic / load intensive (cps, parallel calls)

- Complex logic (routing / integration)

OpenSIPS project

- Open Source, GPL

- Tens of contributions

- Community of thousands

- OpenSIPS Software Foundation

- Heavily accepted and used by industry

OpenSIPS knowledge transfer

- Documentation & manuals

- Advanced tutorials

- Webinars

- Mailing list, IRC channel

- Ebootcamp training

- Certification program

OpenSIPS 1.11

1.11 major release

- 1.11 stable release on 8th of May

- 1.11 is the new LTS

- 1.9 is no longer maintained

- 1.8 (former LTS) and 1.10 to still be maintained for ~ 4 months (until 1.12)

Memory Manager

- A new high-performance Memory Manger which boosts the multi-threading capabilities with +100% .

- Can generate reports on patterns of memory usage (size and fragments)

- Based on previous reports, can do memory warm-up on startup (controlled fragmentation)

Optimizations

• TM – a new implementation for timers to allow parallel processing (multi-process based timers); in previous implementation, the TM timers may easily become a bottle neck leading to a global performance degradation;

• TCP – partitioning of the TCP manager in order to boost the handling of very large number of dynamic TCP conn ; the end-user TCP connections (short lifetime, very dynamic, high cps, high traffic) may raise serious challenges in handling.

Enhancements

- Modules – global parameters moved as function parameters for better flexibility

- Script – a new "for-each" statement to iterate sets

- Script – functions may have missing parameters, like *function(p1,p2,,,p3)*

- Persistent state (on restart and reload) for destinations in Dynamic Routing, Dispatcher and Load-Balancer modules

Registration replication

- Relies on the Binary INternal Interface (BIN) for inter OpenSIPS communication

- User Location module replicates in realtime the registations and their state to other OpenSIPS instances

- Full registration replication on other OpenSIPS instances

Script Helper

- Helps to start in an easy way with the OpenSIPS scripting (the learning curve gets milder)

- Transparent handling of SIP sequential requests

- Automatic dialog support

Call Center

- Call queuing in OpenSIPS (signaling only)

- Inbound call center – multiple queues, sets of agents, skills, priorities

- Integration with Media Server via the B2BUA engine

- To be used in combination with DID (DR module), external IVRs, external dialers.
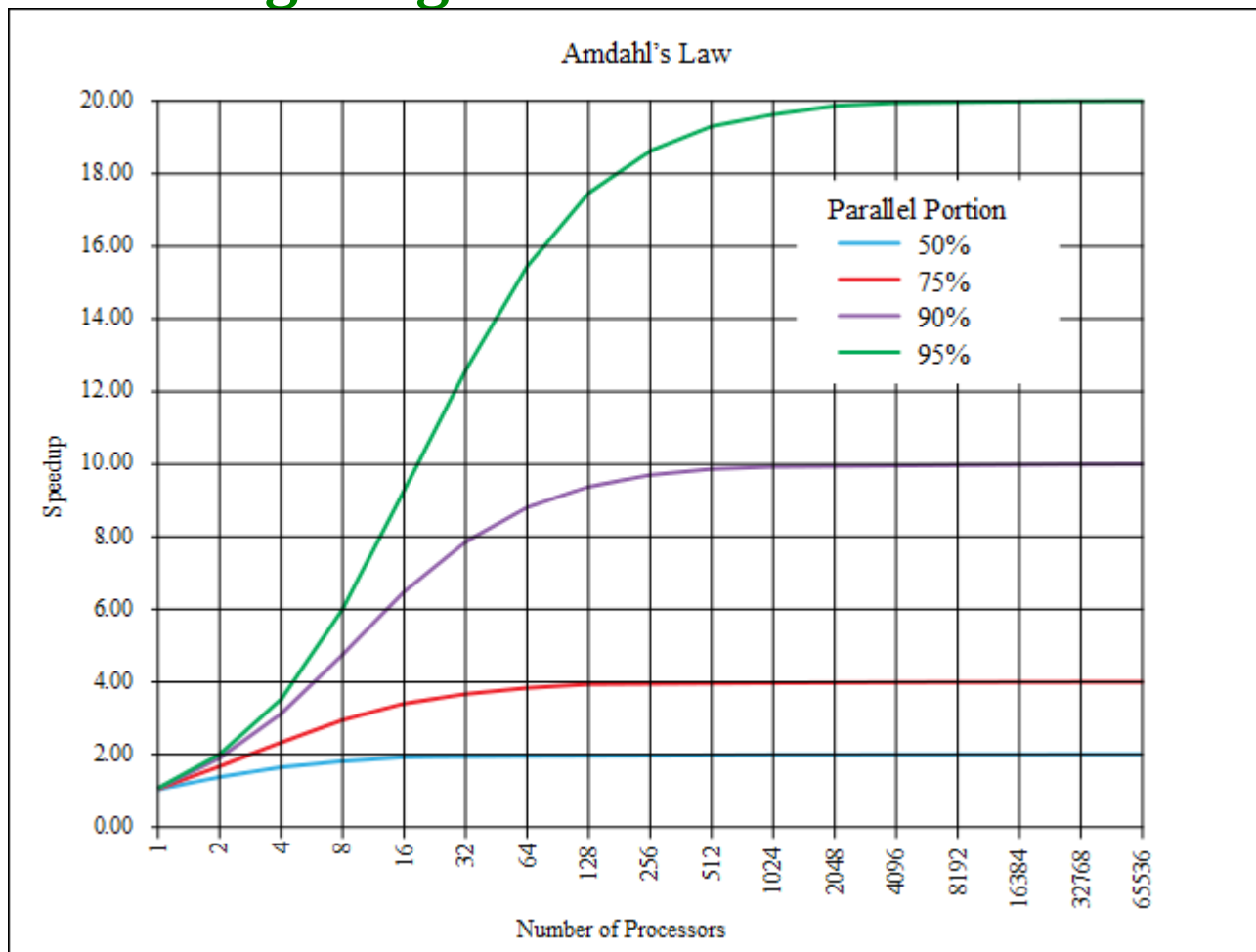
Demo to follow !

MI Json

- First MI backend to provided structured output

- It required complex changes in the MI core

B2B SCA

- Shared Call Appearance support in conjunction with the

B2B engine.

OpenSIPS 1.11 Performance

What are we fighting with ?

High performance memory allocator

- A new high-performance Memory Manger which boosts the multi-threading capabilities with +100% .

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- Based on previous reports, can do memory warm-up on startup (controlled fragmentation)

SIP layer performance

- Eliminated several bottle-necks in Transaction layer by increasing the level of parallelism.

- Partitioning in the TCP stack to increase the parallelism in handling large number of TCP connections.

Results ?

- A boost from 25 000 cps up to around **60 000 cps** while using only 50% of the CPU.

- Easily handling **5 000 000 concurrent calls**

- Handling **400 000** mobile end-users **TCP connections**

OpenSIPS 2.1

A big leap

- OpenSIPS 2.0 became OpenSIPS Experimental

- Experimental branch, a playground to test and validate new radical concepts

- The proven code is ported in OpenSIPS main stream

First porting

- I/O async reactor

- Generic worker processes the can handle different kind of jobs (instead of dedicated ones)

- Timer just fires jobs that are balanced over the worker processes

- Adding contexts for SIP msgs and Transaction (to allow generic data to be added)

Async I/Os

- Support for async operations from script.

- Initial support limited to external interactions – REST queries, exec() calls.

- Requires TM support and scripting enhancements.

Quality based routing

- New module on top of routing engines that uses list of gateways/destinations (like Dynamic Routing, Dispatcher)

- Collect on the fly information about the call's quality (ASR, PDD, ACD, etc)

- Reorder in realtime the used gateways to remove poor quality gateways or to prioritize good quality gateways

- Complex but flexible system of thresholds (multiple levels), alerts and actions.

Routing Data Partitioning

- Partition = a standalone set of routing data that can be separately managed

- Data partitioning allows using same module for multiple different scopes

- Partitions are completely separated (in DB and memory), can be individually reloaded

- Targeted modules : Dynamic Routing, Dispatcher, DialPlan

Fraud detection

- Fraud detection based on calling profiles

- A profile consists of time intervals, number of calls per interval, parallel calls, gray listed destinations

- A subscriber / trunk may get assigned a profile (to detect out of the ordinary calling patterns)

- The modules does detection and reporting (via events), but no action

SIP compression

- Simple SIP-wise traffic compacting :

  - Headers with short names

  - Combine headers with same name

  - Filter out unwanted headers

- Compress the non-routing information (header and body) from a SIP message → a new body

- Reduces bandwidth, minimizes MTU related issues, avoids unnecessary SIP parsing

Transport protocols

- API and module to dynamically provision the TCP/TLS connections (rate, bandwidth, re-usage policy, TCP parameters, SSL certificates)

- Cloud / Amazon better support – more control over advertising or fake interfaces

Thank you for your attention
You can find out more at www.opensips.org
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Questions are welcome