

● VoIP With Free Software In Enterprises

A Field Report

Markus Lindenberg
GONICUS GmbH



About Me

- Technical consultant @ GONICUS
- Consulting, System Administration, Software Development
- VoIP with Asterisk, FreeSWITCH, Gemeinschaft
- VoIP Integration (AMI/AGI/ESL), Device Provisioning
- Other fields
 - Web Service Scaling & Development (Nginx, Python, Django, Flask, PostgreSQL, PHP, ...)
 - Linux Infrastructure DevOp, Data Center Operations

GONICUS*

- Independent Linux service provider and integrator
- Consulting, Implementation, Support
- Founded 2001
- About 30 employees
- Technological and economical know-how
- > 200 years of Linux experience
- Infrastructure, Virtualization, Monitoring, VoIP, Web/Database/File/Print Services, Mail, Routing, VPN, Clustering, Systems Management, Security, Linux Desktop, ...

*King Penguin: (lat.) Aptenodytes patagonicus

About the Customer – LVM



- Mutual insurance company
- Founded 1896
- > 9 million contracts
- > 3 million customers
- > 3.000 employees
- > 2.100 agencies



The Environment: IT at LVM

- > 10.000 users/desks
 - ~3.500 employees in the HQ and field
 - > 500 IT staff
 - Infrastructure
 - Development
 - Service
- > 10.000 Ubuntu workstations
- In house application:
LVM Anwendungssystem '*LAS*'
(*'LVM Application System'*)



The Mission

- Replace aging hardware PBX
 - Siemens Hicom → EOL
 - ATM → MPLS/VPN
- Telephony as IT service
- From PBX to infrastructure
 - Telecommuters
 - Unified LAN/WAN
- Features, features, features



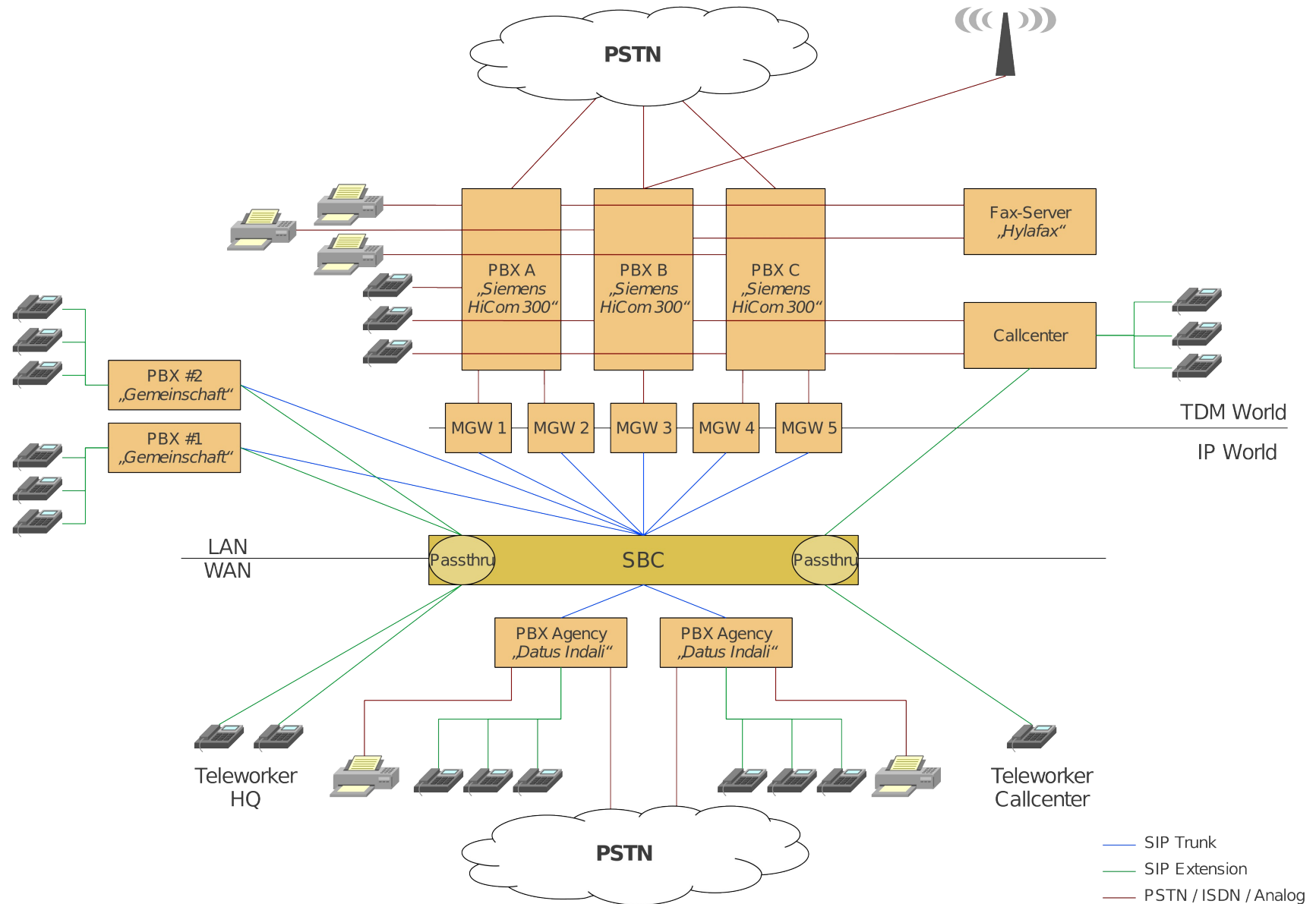
Why Open Source

- Telephony as a software service
 - Well-defined components
- Own ideas and features
 - From now on: 1-2 releases/year minimum
 - Development both in house and by contractors
- No vendor lock-in
- New possibilities: Integration, customization, ...
- Previous OSS experience
 - Servers, workstations, ...

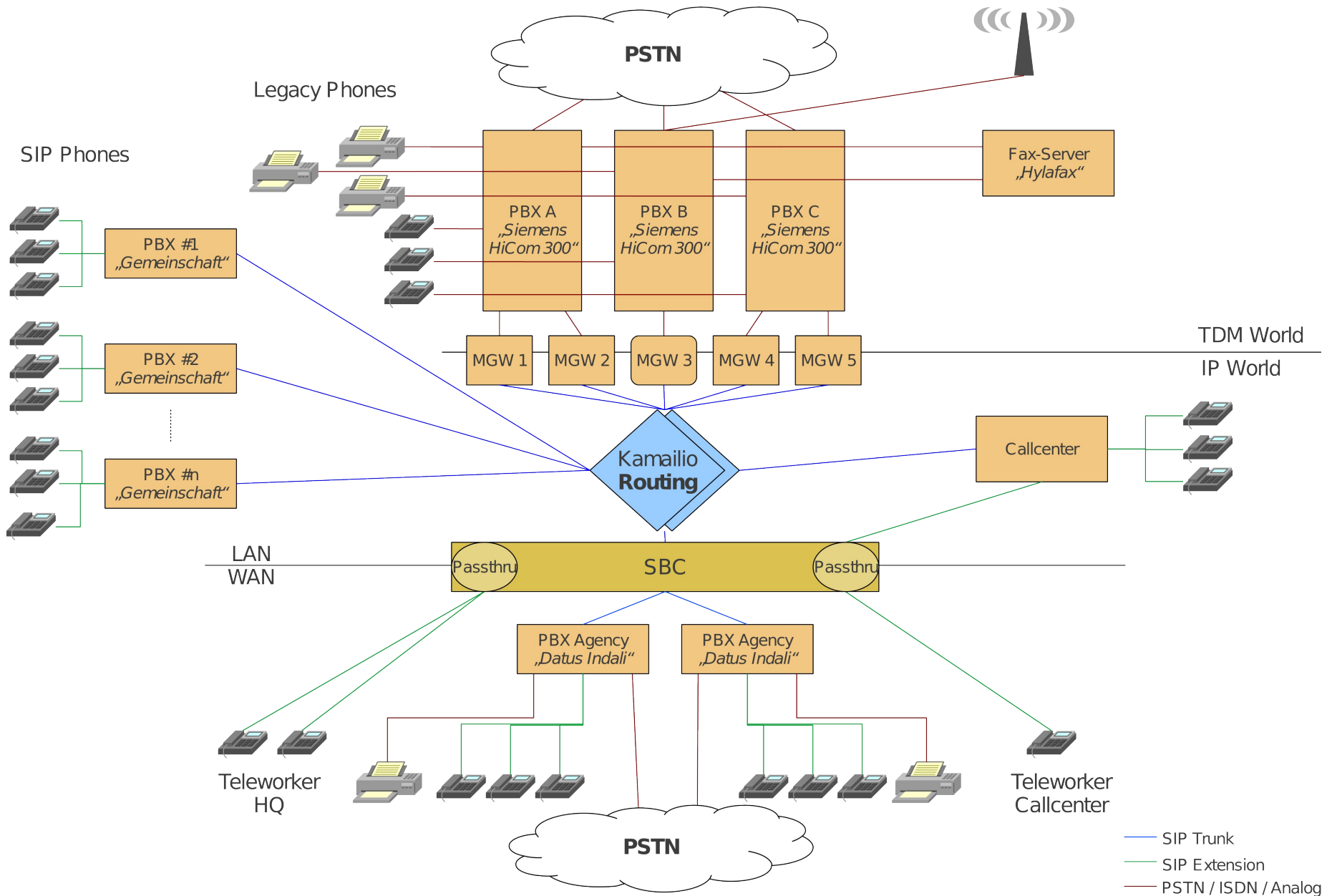
From PBX to Infrastructure

- Media Gateways: Asterisk w/ Digium E1 cards
 - To be replaced with MGW appliances
- Agency PBXes: Datus Indali Asterisk Appliance
- Provisioning and HQ PBXes: Gemeinschaft 3+
 - Certified Asterisk 1.8
- Phones: Siemens OpenStage
- LAN/WAN crossing: Proprietary SBC
- Callcenter: Proprietary
- **Plumbing it all together: Kamailio**

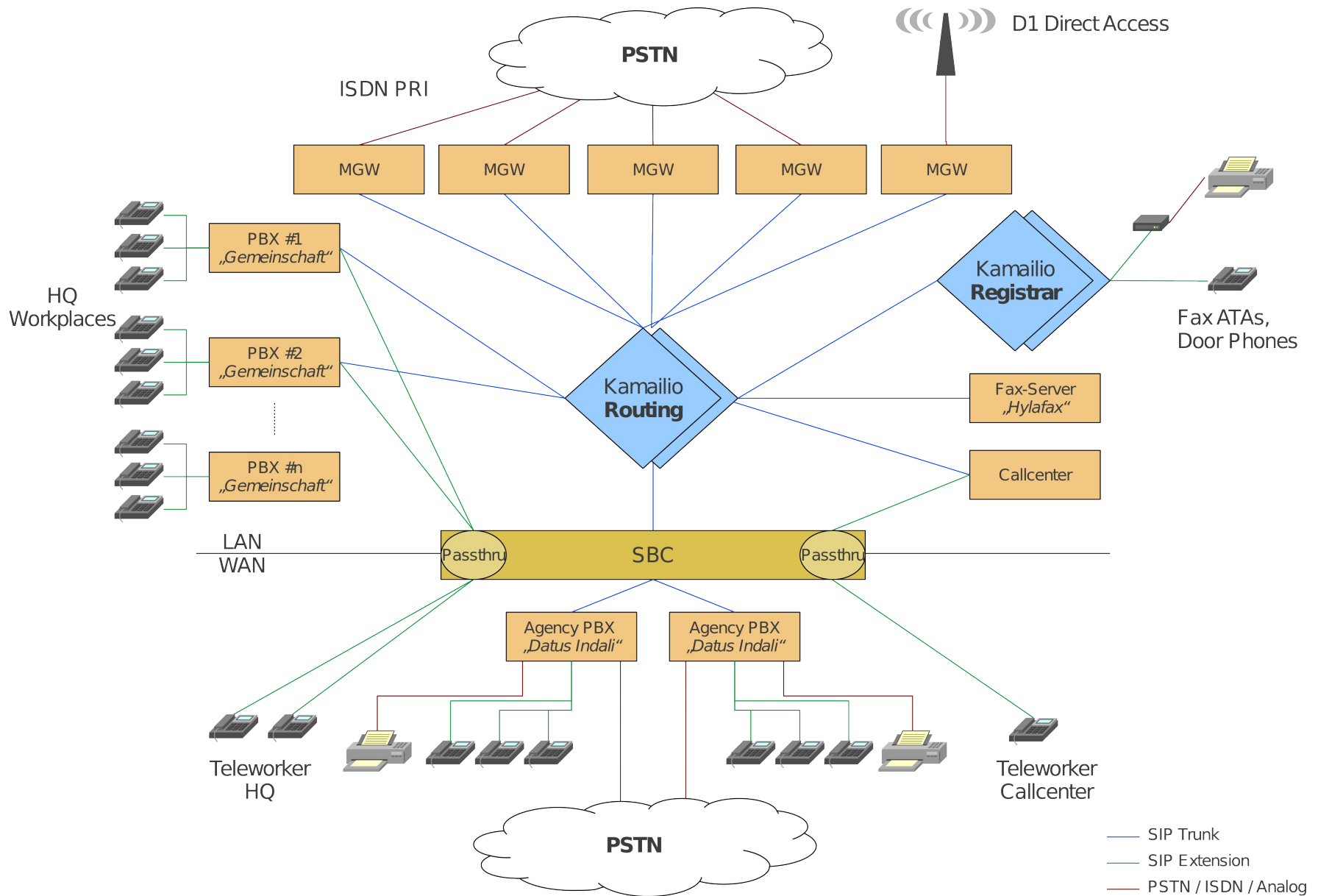
Architecture - Pilot



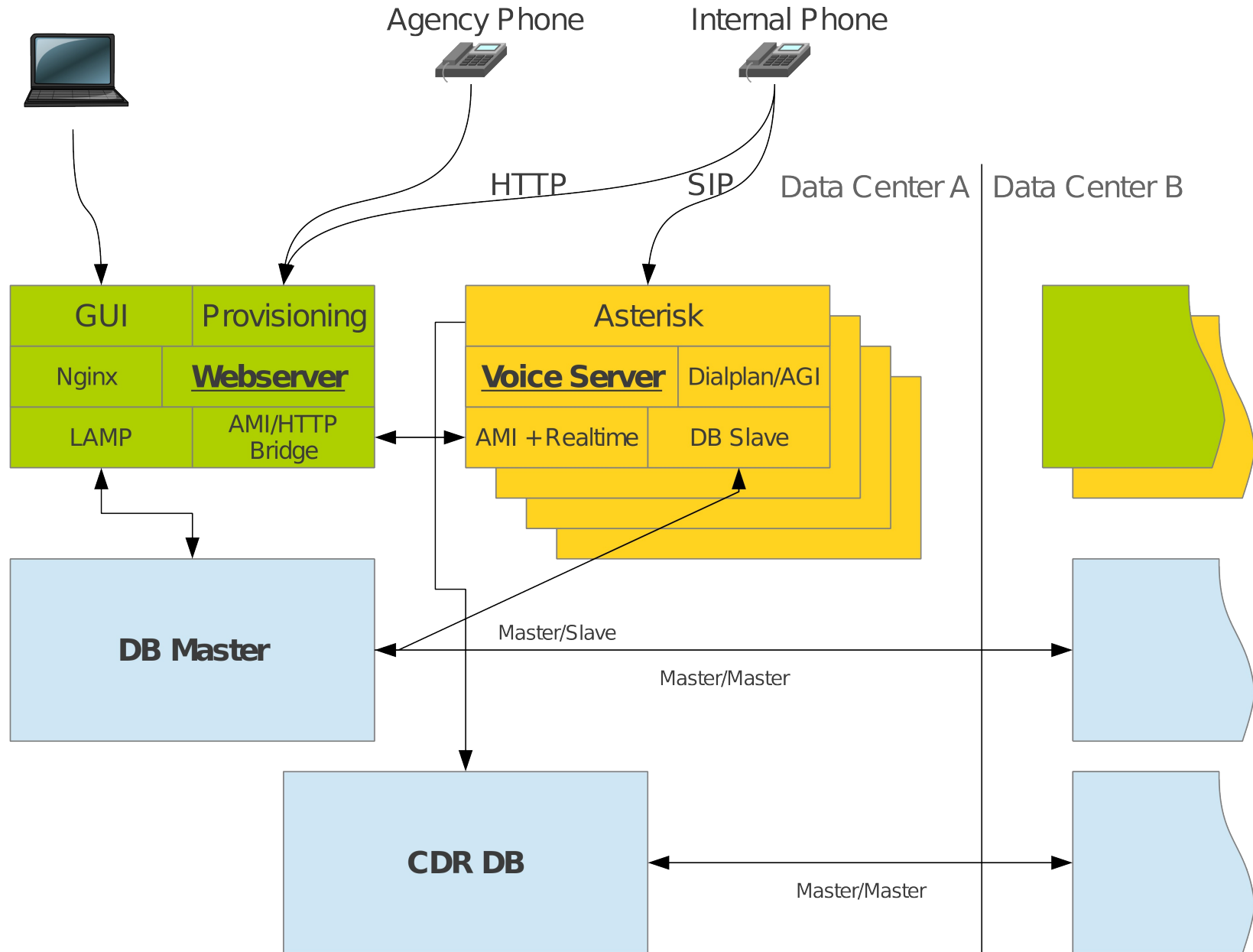
Architecture - Today



Architecture - Later this year



Architecture - HQ PBX



Features: What people expect

Realtime Status Monitors *Callee ID Lookup* *Private Phonebook* *Visual Voicemail*

Call Forward Automation *Caller ID Lookup* *Workgroup Statistics* *Set Outgoing Callerid*

Busy Lamp Field *Web Interface* *Call Distribution* *Company Phonebook* *Voicemail*

Boss/Secretary Setup *On The Fly Conferences* *Click To Dial* *CCBS/CCBR* *Pickup Groups*

MP3 Ringtones *Workload Distribution* *CRM Integration* *Private Calls* *Parallel Call*

Implementing PBX features

- Avoid implementing applications in the dialplan
- Use AGI/FastAGI or high level frameworks
- Best practice / standards compliance vs. user expectations
- **Testing is essential!**

#924	Geheimer B-TIn: CF: Anzeige C: Keine CF-Anzeige
#923	Geheimer B-TIn: Pickup: Anzeige A: Anonymous (statt C)
#909	BLF-Fenster: Nummer von B (statt Nummer von A)
#898	WS: CF: Unterscheidung zwischen "alle sprechen" und "keiner eingeloggt" nicht möglich
#897	WS: Rückruf-Angebot nach CF
#895	WS: Eintritt während der Agenten-Klingelpause möglich
#894	Anmeldung nach Ummeldung: Falsche Zuordnung "Telefon - Nummer"
#889	CT attended with consultation (Übergabe durchführen): A sieht NameC aus dem persönlich
#888	WS: "CF bei leer": Anzeige C: CFU (statt CFB)
#883	AG > Hicom-RG > 1.0-AbAp: Verbindungsabbruch nach 5 s
#879	G-IbAp > Hicom > CT attended without consultation (Übergabe) > 0.9-IbAp: Kein CT / Ab
#874	AG > AG > CFU > Hicom: Anzeige C: Name von B fehlt
#870	1.0-IbAp > Hicom > CFU > Hicom: Anzeige A: Keine CF-Anzeige

Performance considerations

- Performance
 - Complex call setup
 - Not a carrier → CPS is not an issue
 - Heavy use of Presence / BLF strains chan_sip
 - Presence to Web → Node.js
- Availability
 - Scheduled downtimes outside business hours possible
 - Outages unacceptable from business PoV, but not life threatening

Integration

- Click to dial / customer & callerid lookup
- Conditional call routing
 - If user is busy with other tasks, don't route customer calls there
- ToDo: Integrate with Instant Messaging
- Providing and using RESTful / HTTP APIs is easy
 - But can lead to chaos → keep track
- Expect external services to fail
- Degrade gracefully, keep connecting calls

Conclusion

- No need to replace everything at once, soft migration possible
- Reliability is on par with commercial offerings
- Perfect integration in customer's IT (OS, monitoring, databases etc.) and business logic
- Ideas for enhancements keep coming in
- Implementing them is (almost) always possible
- Continual improvements , telephony is now part of IT

Thanks ...

... for your attention and time



Markus Lindenberg

lindenberg@gonicus.de

GONICUS GmbH

Möhnestr. 55

59755 Arnsberg