Implementing SRE in a Telco with Reliability Enhancing Procedures

SREcon, Dublin, October 2023
Florian Kammermann & Romain Bonjour... and many others.
Mobile 54%  
Broadband 49%  
TV 39%

B2C market shares (Population, 8.7 Million)

~16,000 employees

Voice & Internet Connectivity
Enterprises Services
Emergencies Services

Brand Finance
Rank 1
the strongest brands in Switzerland

Nr.1
A typical User Journey we produce

Alice calls **EMERGENCY** on wireline from mobile
**BECAUSE HER FRIEND HAD AN ACCIDENT**
A complicated context

• Large variety of Services
• Complex E2E chains
• Legacy Technologies
• Very high expectations

• As everyone, a lot of business pressure...
Swisscom boss apologises for massive network outage - newspaper

Reuters
July 14, 2021 7:57 AM GMT+2 - Updated 2 years ago

Swisscom kann Internet-Störung schnell beheben

Swisscom meldet am Dienstagnachmittag eine schweizweite Beeinträchtigung des Internets. Spezialisten konnten das Problem schnell beheben.

Swisscom resolves nationwide emergency number breakdown
SRE will save us all
SRE is magic, religious, will solve it all

The SRE Enthusiasts were like

The Swisscom Operation Department was more like

ITIL is the Solution to all our Reliability Problems
SRE Principles and Best Practices as Inspiration

**Simplicity**
Service Centric approach
⚠️ Service Modeling

**Embracing Risk**
demystify the 100% Reliability myth

**Service Level Objective**
We need a data driven approach to manage Reliability

**Monitoring**
We need to Monitor the right thing ... User Journeys
Organizational changes are never easy
Challenge #1

Every department has its own understanding of reliability
Challenge #2

Operation and reliability should be a continuous process
Challenge #3

Legacy technologies are here to stay
A common language on reliability
REPs are clearly defined *cookbooks* allowing us to scale & measure the implementation of *Reliability practices*
A initial set of REPs to cover various aspect and change our way of working

REP1  Model Your **Service Definition**

SMA  **Service Management Assessment**

REP3  **Service Roasting**

REP5  Introduce **Service Level Objectives**

REP6  **Service Continuity & Disaster Recovery Plan**

REP8  Resilience **Testing in Production**

REP2  Service **Availability Requirements & Reliability Design**

REP4  **Provide Service Specification & Usage Instruction**

REP9  **Operation Response Testing**
REPs are pragmatic, scalable, easy to teach & apply, common way of increasing our reliability
REP1: Model your Service Definition
A way to understand and document how our E2E services are produced & operated

- REP1 Model Your Service Definition
- SMA Service Management Assessment
- REP3 Service Roasting
- REP5 Introduce Service Level Objectives
- REP6 Service Continuity & Disaster Recovery Plan
- REP8 Resilience Testing in Production
- REP2 Service Availability Requirements & Reliability Design
- REP4 Provide Service Specification & Usage Instruction
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Mobile Voice Basic

Features
- Mobile Originating Calls
- Mobile Terminating Calls
- Emergency Calls

User Journeys
- MO call in 4G (VoLTE) in HPLMN
- MO call over Wifi (VoWifi) in HPLMN
- MT call in 3G in HPLMN
- MT call over Wifi (VoWifi) in HPLMN
- MO emergency call in 4G (VoLTE) with SOS bearer
- MO emergency call in 3G (regular call setup)

Resources
- Application 1
- Network Function 1
- Physical Device 1
- Application 2
- Network Function 2
- Application 2
REP1: Model your Service Definition
A way to map accountability on how our E2E services are produced

**My Service**
- Resource A
- Resource B
- Resource C

**Service A**
- Resource X

**Service B**
- Resource X

**Service D**
- Resource X

**Service E**
- Resource X

**Teams**
- Team A
- Team B
- Team D
- Team E

**Dependencies**
- Depends On by SLO

**Accountability**
- My Team

**Reliability Enhancing Procedure**
- Service Owner
- execute on
REP1 is about getting structured data on our Service and Resource landscape
An initial set of REPs to cover various aspect and change our way of working

REP1 Model Your Service Definition

REP2 Service Availability Requirements & Reliability Design

REP3 Service Roasting

REP4 Introduce Service Specification & Usage Instruction

REP5 Introduce Service Level Objectives

REP6 Service Continuity & Disaster Recovery Plan

REP7 Service Management Assessment

REP8 Resilience Testing in Production

REP9 Operation Response Testing
REP3: Service Roasting
REP3: Service Roasting
Phase 1 – Get the big pictures

✓ A clear service description
✓ Big pictures with lenses
✓ Common understanding
### REP3: Service Roasting
Phase 2 – Roasting

<table>
<thead>
<tr>
<th>PROBABILITY</th>
<th>Negligible</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Severe</th>
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<tbody>
<tr>
<td>Almost certain</td>
<td>1 risk</td>
<td>2 risks</td>
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<tr>
<td>Very likely</td>
<td>1 risk</td>
<td>1 risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>2 risks</td>
<td>1 risk</td>
<td>2 risks</td>
<td>1 risk</td>
<td></td>
</tr>
<tr>
<td>Unlikely</td>
<td>5 risks</td>
<td>5 risks</td>
<td>5 risks</td>
<td>1 risk</td>
<td>1 risk</td>
</tr>
<tr>
<td>Very unlikely</td>
<td>2 risks</td>
<td>2 risks</td>
<td>3 risks</td>
<td>1 risk</td>
<td></td>
</tr>
</tbody>
</table>

- ✓ For every lines, boxes, and arrows, ask yourself: **What can possibly go wrong?**
- ✓ Clear starting point
REP3: Service Roasting
Phase 3 – Continuous Improvement

- ✓ Reliability
- ✓ Backlog
- ✓ Transparency for customers
- ✓ Ready for SLO breach

Error Budget Policy

- SLO reached (Business as usual)
- SLO missed (Only work on reliability)
An initial set of REPs to cover various aspect and change our way of working

- REP1 Model Your Service Definition
- REP2 Service Availability Requirements & Reliability Design
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- REP8 Operation Response Testing
REP8: Testing in Production
Failovers in-between our Datacenters

Cloud-based Mobile Connectivity Services

User Services (Internet, Voice, ...)

Transport Network (Base Station to Core)

DC1

Network Function A
VM
VM
Network Function B
VM
VM

DC2

Network Function A
VM
VM
Network Function B
VM
VM

DC3

Network Function A
VM
VM
Network Function B
VM
VM

DC4

Network Function A
VM
VM
Network Function B
VM
VM
Don't forget the ITIL Practices
How we married ITIL and SRE

ITIL Practices
Set of organizational resources designed for performing work or accomplishing an objective.

Reliability Enhancing Procedures
Set of organizational resources designed for performing work or accomplishing an objective.

Non-Functional Requirements
Set of organizational resources designed for performing work or accomplishing an objective.

Service management practices
- Availability management
- Business analysis
- Capacity and performance management
- Change enablement
- Incident management
- IT asset management
- Monitoring and event management
- Problem management
- Release management
- Service catalogue management
- Service configuration management
- Service continuity management
- Service design
- Service desk
- Service level management
- Service request management
- Service validation and testing

Concretize
Define
Help to fulfill
Reliability Enhancing Procedures

REPs are clearly defined *cookbooks* allowing us to scale & measure the implementation of *SRE practices*
Don't fight the system, use it, make it better
The REPs allow us to fulfill various needs at once

- Implement SREish practices
- Clear Procedure & Deliverable
- Measure changes
- Help people to rethink
- Increase service maturity
- Provide a common language
All good now?
Reach out

and thank you

Adapted from turnoff.us enterprise vs startup journey to cloud