The Internet Is Your New Network

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Agenda

- About me, and why my history is applicable here
- The Internet is complex, but you still have to fix it immediately
- Your Internet Stack: Breaking down experiences by how they can be monitored
- Changing (changed?) landscape
- How ntop fills visibility requirements for Catchpoint





About Me





Sergey leads global engineering, data analytics and quality assurance teams at Catchpoint, improving the performance and resilience of the Catchpoint platform.

Sergey holds bachelor's and master's degrees in Computer Engineering from the Rochester Institute of Technology. Prior to Catchpoint, he spent his career at companies trying pushing the boundaries of what's possible on the internet, with roles at Coyote Point, Fortinet, and Interface Masters/Niagara Networks.

At these roles, Sergey developed products which improved network performance, security, and application delivery, garnering several patents. Now at Catchpoint, Sergey is using his previous experience of what can go wrong with networks and applications to make the internet more resilient.







... also look for this guy in the room.



Alessandro runs the Italian team at Catchpoint, and loves answering questions!



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What I was used to: IN MY APPLIANCE BUBBLE



How digital experiences are delivered: **REALITY**





The Internet is your new Network &

THE INTERNET IS COMPLEX ...

Multiple techniques are needed to understand its performance

Sergey's Blind Spot Scorecard (Pre-Catchpoint)

	Internal Application	External Application	Infrastructure / Network	Dependency	•
High Control					•
Low Control					•
No Control					





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Catchpoint's Blind Spot Scorecard (Pre-ntop)

	Internal Application	External Application	Infrastructure / Network	Dependency
High Control				
Low Control				
No Control				





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The IT Mandate: Detect, Identify, Fix Faster







Delivering Resilient Digital Services

• Two Traditional Areas That Need Attention

Code/infrastructure you own:

- Full control
- APM, observability tools monitoring infrastructure, network, logs and tracing code, etc.







3rd party services you rely upon:

- Limited or no control
 - $\circ \quad \text{Offered SLAs}$
- You need to map & monitor the Internet Stack



Map the Internet Stack with Internet Performance Monitoring (IPM)

Provides full visibility into the internet stack so you can catch any issues before they impact your business.



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Exercise: What applications do you care about?

Internal Applications	Customer Applications		Dependencies	
				Higher Control
				Lower Control
		(



What applications do you care about?

Internal Applications	Customer Applications	Dependencies	
	Your SaaS Product	BGP (next hop)	
Sharepoint Salesforce	3 rd Party Integration	DNS	Higher Control
SAP	Zendesk	BGP (other hops)	Lower Control
Office 365 Zoom		Email CDN	

Which are the most important? What happens if they experience an issue? How can you tell?



What does it mean that they're important?

- Revenue / productivity impact if they're down for some or all (availability & reachability), if they're slow (performance), if they have errors (reliability).
- Resiliency is composed of:
 - Customer experience
 - Workforce Productivity & Morale
 - Application Performance
 - Network Performance
 - Reduced third party risk
- In summary: An important application must be resilient. **But how can you tell?**



Active (Synthetic) vs. Passive (RUM) monitoring

Active

- Proactively find issues by simulating activities
- Only as good as the locations (vantage points) and level of simulation
- Because every measurement is the same, data has high Signal to Noise ratio



Passive

- Measure actual application activity, from real users
- If you see a problem in the data, a customer already saw a problem in real life!
- Very noisy
- Harder







High Control Application (Your Applications)

Endpoint Internal External RUM Monitoring User User Synthetic: Synthetic Measure from where users are **High Control** Application RUM, APM & Server-side NPM: Not possible **Endpoint monitoring for internal** users provides both Synthetic and **RUM ability*** Your Network NPM catchpoint 18

Low Control Application (SaaS, 3rd Party, ...)

The Future of Work Is Hybrid

Percentage of Employees Indicating Their Remote Work Preferences



Both — Home & Office

62%







Not Remote — Office **13%**

Source: 2020 Gartner Improving Employee Engagement Survey



Endpoint monitoring in a nutshell





- Web Applications: Browser extension to observe performance
- Native & Web: Synthetically test APIs
- Device: Collect OS/hardware telemetry
- Native Application: **Use ntop**!



UCaaS Monitoring using ntop + Synthetic



Customer Needs:

- Know in advance if a call will produce un-usable audio/video before the call starts ← Synthetic, aggregated RUM
- Have confidence that important client calls will not unexpectedly drop out or stutter Synthetic, RUM
- Test which UCaaS service will produce the best connection between two or more devices ← RUM
- Determine the possible fault for a call interruption and distinguish between device, network, and application faults Synthetic, RUM
- Store historical call data to track patterns or abnormalities in service quality
- Warn all employees in areas with potentially interrupted service so they can shift their schedules or use a backup UCaaS system Synthetic, aggregated RUM

Solution:

- Measure APIs using Synthetic
- Collect performance metrics like R-Factor using nProbe protocol dissection (Zoom & Teams)
- Combine both to obtain the right level of insights



Real-time Transport Protocol (RTP) Monitoring with ntop



- RTP monitoring extended to report call quality for common VoIP desktop apps
 - Zoom and Microsoft Teams
- Call quality represented by R-Factor and MOS metrics
- Additional RTP metrics provide more insights
 - Jitter
 - RTT
 - Packet Loss

User Satisfaction Level	MOS	R-Factor
Maximum using G.711	4.4<	93
Excellent	4.3 - 5.0	90 - 100
Good	4.0 - 4.3	80 - 90
Satisfied	3.6 - 4	70 - 80
Dissatisfied	3.1 - 3.6	60 - 70
Fully dissatisfied	2.6 - 3.1	50 - 60
Not recommended	1.0 - 2.6	Less than 50



Endpoint Monitoring with Catchpoint + ntop





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Catchpoint's Blind Spot Scorecard (with ntop)

	Internal Application	External Application	Infrastructure / Network	Dependency
High Control				
Low Control				
No Control				





What makes Catchpoint + ntop special?

Monitor what matters

Our focus is on monitoring every aspect of the internet stack



Monitor from where it matters

The largest observability network inside the internet



To catch issues before they become incidents

HD real-time data, advanced correlation, experience scores and analysis/drill-down tools







Thank you!

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