Application: 5547

Netflix’s Service-Level Prioritized Load Shedding for Seamless Streaming at Global Scale

Page: General Information

Provide information about the company to be considered for the award. If you will be nominating an individual, specify the nominee’s employer.

Name of Organization/Company

Netflix

[redacted]

Additional Contacts

I would also like to have others receive emails about the disposition of our entries.

Page: Entry Information

Entry Title

Netflix’s Service-Level Prioritized Load Shedding for Seamless Streaming at Global Scale

Category

L03. Technical Innovation of the Year - Entertainment Technology

Technical Innovation of the Year Submission Format

Written Answers

a. Briefly describe the organization that achieved the nominated technical innovation: its history and past performance (up to 200 words). Required

Netflix is a global leader in streaming entertainment, known for its relentless innovation in content delivery and technology. Founded in 1997 as a DVD rental-by-mail service, Netflix transitioned to online streaming in 2007, revolutionizing how people consume television and film. Today, the platform serves over 230 million members across more than 190 countries, offering a vast catalog of movies, series, and original programming.

Netflix has consistently pushed the boundaries of engineering to deliver a seamless, high-quality viewing experience. The company pioneered adaptive bitrate streaming, built one of the world’s largest content delivery networks (Open Connect), and has led advancements in video compression, device compatibility, and observability.

A hallmark of Netflix’s technical culture is empowering engineers to innovate—from chaos engineering practices to sophisticated personalization algorithms. In recent years, Netflix has expanded its focus to include live streaming, presenting new engineering challenges at massive scale. The innovation of service-level prioritized load shedding is a direct result of this culture, enabling live event traffic to be handled gracefully without compromising reliability. This achievement underscores Netflix’s commitment to continuous improvement and operational excellence, reinforcing its reputation as a technology-driven media powerhouse.

b. Outline the nominated technical innovation. Be sure to describe it in terms that someone with limited knowledge of the technology can understand and appreciate (up to 250 words). Required

The nominated innovation is Netflix’s implementation of service-level prioritized load shedding—a technology that helps ensure uninterrupted streaming, especially during massive events like live sports or global premieres.

When millions of people try to stream content at the same time, Netflix’s systems can experience sudden surges in traffic. Without safeguards, this can overwhelm the backend, causing playback failures or long delays. Traditionally, companies have handled this by either overbuilding their systems (which is expensive) or limiting all types of traffic equally (which can impact user experience).

Netflix, led by Staff Engineer Anirudh Mendiratta, developed a smarter solution: service-level prioritized load shedding. Instead of treating all traffic the same, the system distinguishes between critical user actions—like hitting the play button—and non-essential ones, such as background pre-loading of content. During spikes, the system automatically ensures that important user requests are served first, while less important ones are temporarily dropped.

This innovation was crucial to launching Netflix’s live streaming platform, where traffic patterns are unpredictable and timing is critical. It allowed Netflix to support major live events with minimal added infrastructure, maintaining smooth playback for users even under heavy load.

By making the streaming experience more reliable and cost-efficient, this innovation not only improves viewer satisfaction but also sets a new industry benchmark for how large-scale digital services can stay resilient under pressure.

c. Explain why the technical innovation you have highlighted is unique or significant (up to 250 words). Required

This innovation is significant because it redefines how large-scale digital services prioritize and protect user experience during extreme traffic conditions—without relying on costly infrastructure overprovisioning.

Most traditional systems treat all incoming requests equally, or they isolate different types of traffic using separate infrastructure, which increases cost and operational complexity. What makes Netflix's service-level prioritized load shedding unique is its ability to differentiate between critical and non-critical requests within the same service, dynamically and intelligently.

Instead of physically separating traffic, the system uses smart software logic to guarantee capacity for essential playback actions—like when a user presses play—while deprioritizing background tasks such as pre-loading recommendations. This allows Netflix to absorb sudden surges in demand, such as during global live events or outages, without impacting core functionality.

This approach is not only technically elegant, but also highly practical. It helped Netflix successfully launch and scale live streaming, a new and strategically important product line. During one real-world incident, the system preserved over 99.4% availability for user-initiated playback—even under a 12x traffic spike—demonstrating its resilience in action.

By embedding Quality of Service (QoS) principles at the application level, this innovation brings a network-level concept into modern cloud microservices, influencing how resilient software systems can be designed in the future. It's a solution that balances performance, cost, and user experience—hallmarks of impactful engineering.

d. Reference any attachments of supporting materials throughout this nomination and how they provide evidence of the claims you have made in this nomination (up to 250 words). Optional

The first link is the Netflix TechBlog post explaining prioritized load shedding, how it was tested and deployed at Netflix. The second link is press coverage of the blog post in infoq, an influential online publication. The third link is Anirudh's linkedin profile.

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Would you like to add an additional webpage link?

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Would you like to add an additional supporting document?

No

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