



Netcracker 2020: Ushering in the Service Provider Digital Transformation Renaissance

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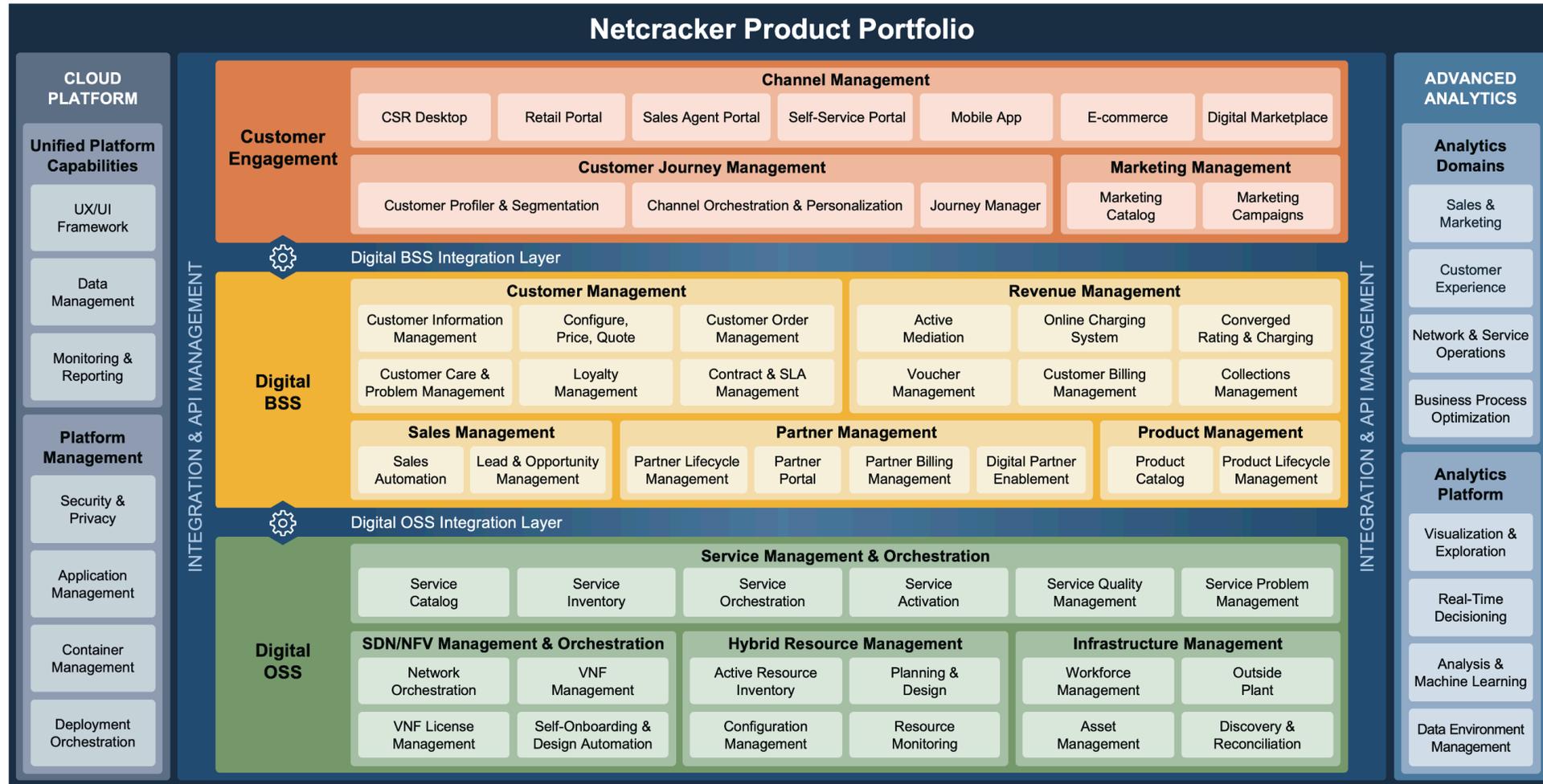
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Overview: Unparalleled Value for CSPs

CSPs are struggling to attain prime mover and influencer status in the global digital ecosystem due in large part to their unfulfilled and incomplete digital transformation journeys. In contrast, hyperscale/Web-scale players, such as the top-tier cloud service providers, command deep influence across the entirety of the global digital market. Now is the time for communications service providers (CSPs) to disrupt the competitive landscape and attain unparalleled digital ecosystem influence, completing their transformation into digital service providers. Otherwise they risk becoming marginalized players into the foreseeable future.

Netcracker 2020 is the modernized, digital portfolio of products and services, both redesigned and enhanced, that fulfills the CSP quest to complete their transformation journeys that are essential to powering the digital experiences and commerce of their customers in the 5G era. Netcracker 2020 is purpose developed to ensure CSPs are equipped with the digital foundation required to facilitate their digital transformation journeys including cloud strategy optimization, foolproof security, personalizing and customizing the customer experience, driving partner ecosystems, and attaining wide-scale automation.

I. Netcracker 2020: What's New and Different?



Netcracker 2020 continues Netcracker's innovation heritage and is already deployed in multiple CSP networks including high-profile operators Vodafone and Rakuten. Netcracker 2020's early market success attests to Netcracker's ability to deliver the breakthroughs essential to minimizing the obstacles delaying CSP digital transformation. Three of the foremost capabilities include:

- **Cloud Readiness.** Provides cloud-native functions underpinned by a microservices-based approach and continuous software releases using DevOps/ Agile processes, enabling CSPs to successfully administer multi-cloud implementations especially across top-tier public clouds.
- **Security-first Approach.** Actuates the security framework CSPs must establish to provide the holistic security and privacy assurances their customers demand, especially during times of crisis.
- **Open and Standards Sanctioned.** Fully open cloud platform and portfolio with Open APIs and API management key to accelerating commercialization of services and CSP development of new features.

New Digital BSS Advances



Netcracker's OSS/BSS DNA is fundamental to cultivating Digital BSS advances, which Netcracker 2020 precisely delivers. These new capabilities include:

- **Mobile-first Digital Experience.** Provides the contextually aware and flexible mobile experience, aligned with all customer channels and business activities, which is key to analytics-driven personalization of interactions and offerings.
- **Enhanced Partner Management.** Unique capabilities include rapid partner onboarding, support of multiple partner-driven business models, and assured access to a deep and expanding partner ecosystem.

- **Converged Revenue Management for 5G.** Enables monetization through a distributed charging architecture, slice-based rating scenarios, real-time billing on-demand capabilities and support for new payment mechanisms.
- **Cross-industry Loyalty Management.** Through a service-agnostic loyalty engine, Netcracker 2020 translates the consumption of any service into membership points, includes a gamification platform to entice customers and manages the transfer of that value within the partner ecosystem.

Futurum Perspective:

The new Digital BSS capabilities embedded in Netcracker 2020 are vital to powering CSP success in engaging swiftly evolving markets. With Netcracker 2020, CSPs lock-in the economic and scaling benefits of deploying their cloud-native BSS across hybrid cloud environments, spanning their telco and public cloud resources, ensuring ironclad delivery of a stable and consistent omnichannel customer experience.

New Netcracker 2020 BSS capabilities support the sales automation and configure price quote (CPQ) tools critical to realizing B2B and B2B2X sales success using lead-to-order process digitalization. Equally important, CSPs are finally in the driver's seat to helm digital partner ecosystem enablement, quantum leaping their influence in powering digital collaboration and transactions.

Through built-in converged revenue management features, CSPs are able to fully monetize their 5G service packages and offerings. CSPs strengthen their revenue management agility using unified management of digital and traditional products through Netcracker 2020's cohesive enterprise catalog, offering OTT, IoT, 5G, and SDN/NFV products under a common umbrella. And with the integration of the portfolio's advanced analytics engine, CSPs significantly broaden their addressable market and 5G use case scenarios.

Overall Netcracker 2020 spurs CSPs to use its new digital BSS capabilities to become the prime facilitator of their customer's digital experience as well as the prime influencer of driving digital partner collaboration and agile B2B engagements.

Digital OSS Innovation



Netcracker's organization-wide OSS/BSS heritage is the cornerstone to advancing Digital OSS innovation, which Netcracker 2020 provides. These new features include:

- **5G and Cloud Operations.** 3GPP compliant slice management functions for dynamic orchestration of network slices within a single domain or blending multiple domains, ETSI sanctioned MEC orchestration functions (MEAO) to support placement and lifecycle management of MEC applications at near and far edge locations.
- **Expansion of MANO to Include CNFs.** Netcracker MANO (Network Orchestration and VNF Manager) supports container-based network functions (CNFs)

and VNFs as well as container-based and virtual network services. CNF onboarding uses the same TOSCA models with modifications for CNFs.

- **Full Automation of xNF Design and Onboarding.** Netcracker has added open source DevOps tools to fully automate the entire onboarding process including design, testing, and publishing. Any network function (PNF, VNF, and CNF) can now be self-onboarded and published by CSPs in the marketplace.
- **Intent-Based, Model-Driven Orchestration.** Business intent-based on standard service models such as TOSCA and YANG. The orchestration systems process the declarative intent and use the service models to automatically provision technical subsystems.
- **Expansion of Domain Orchestration (DO) to New Domains.** New domains include Open vRAN DO, SD-WAN/LAN/Wi-Fi DO, MEC edge DO and 5G core DO.

Futurum Perspective:

The new Digital OSS capabilities integrated into Netcracker 2020 are crucial for accelerating CSP objectives to thoroughly embrace digital modeling, encompassing automation of service, resource, xNF, onboarding and management capabilities as well as catalyzing intent-based declarative modeling.

Through Netcracker 2020, CSPs fulfill their IT and network use case requirements, blending cross-domain orchestration with domain orchestration and automation of core, RAN, fixed edge, SD-WAN, and IP/MPLS technologies. In particular, CSPs fortify their OSS for emerging 5G requirements, extending full operational support across their domains and leveraging Netcracker alliances across the MEC/ RAN and slice management spheres. Indispensable to increasing their influence in the 5G ecosystem and the reliability of their 5G offerings, Netcracker 2020 supports the connectivity and eSIM management requisite for securing and scaling their 5G services.

New Netcracker 2020 OSS capabilities are built on the openness required to ensure compliance with the most important digital OSS-related standards such as

MEF, ETSI, and OASIS as well as TM Forum Open APIs certification critical to application onboarding and innovation.

In sum, Netcracker 2020 gives CSPs the peace of mind critical to advance their digital operations with minimal interruption, overcoming long-standing obstacles related to digital modeling assimilation, orchestration adoption, and addressing 5G unknowns. Netcracker 2020's openness and API management flexibility are the difference makers for today's CSPs.



Professional Services Upgrades

Netcracker's latest investments in the company's Professional Services portfolio further boost the Netcracker 2020 proposition. The new offerings consist of:

- **Value-Based Approach.** CSPs can pinpoint core program objectives using its unique Benefit Realization Management methodology to design a digital transformation roadmap in line with business priorities and to apply the company's Managed Services-enabled transformations to gradually transition to the new solution.
- **Delivery Optimization.** CSPs gain from Netcracker's prime systems integration services and end-to-end program ownership to rapidly expedite Blueprint-based solution design and select the best fitting solution implementation model that uses Agile methodology and best practices (i.e., Scrum-based, hybrid approaches, etc.)
- **Enablement of XaaS Models and Cloud Adoption.** Netcracker provides a set of specialized, cloud enablement services that help CSPs build, migrate or enhance cloud-native IT settings. These include multicloud hosting options, including partner-based

public cloud hosting (AWS, Azure, and Google Cloud), fully outsourced analytics-driven operations and management of business processes on behalf of the customers and enhanced security capabilities that ensure outstanding solution reliability, stability, and availability.

Futurum Perspective:

Further fortifying Netcracker's Professional Services suite, Netcracker 2020 catalyzes the value-based approach vital to CSP digital transformation goals. CSPs can now identify core program objectives using Netcracker's distinct Benefit Realization Management methodology to plan a digital transformation roadmap that aligns with business objectives and leverages the company's Managed Services-enabled transformations to incrementally transition to the new solution.



II. Powering CSP Customer Engagement Strategies



Netcracker 2020 helps CSPs to innovate customer engagement with an intuitive mobile-first self-service offering, optimized sales process within digital channels, AI-driven targeted and next-best offers, enhanced agent toolset offering a 360-degree customer view and end-to-end (E2E) customer journey management.

Futurum Perspective:

No CSP digital transformation journey can succeed without a digital engagement stratagem. One of the core principles of digital transformation is that it is meant to improve the customer experience, both on a digital and omnichannel basis. Netcracker 2020's

success lies in the portfolio's ability to enable CSPs to control their own customer engagement destinies by delivering first-rate customer experiences – whether those customers are consumers or businesses.

Today's customers have more choices than ever in choosing their digital service provider putting the onus on CSPs to optimize their customer engagement models that stand out in relation to cloud, OTT, and competing virtual network operator alternatives. Netcracker 2020 assures CSPs fulfill their customer demands for an uncompromised digital network over which to conduct their business and online endeavors. This requires enabling customers to have total visibility

and control over their interactions and transactions, especially including in-flight changes to orders, dynamic billing parameters, and any input that impacts their engagement.

Netcracker 2020 allows CSPs to apply AI and advanced analytics to maximize their identification of the best offers, targeting customers according to their personalized preferences while respecting mandated privacy and security safeguards. CSPs immediately boost their customer experience strategies using AI-driven contextual interactions that unify their own services with their partner offerings. AI-driven intelligent prediction and customization will make customers feel as if every CSP product or B2B experience was tailored exclusively for them.

Netcracker 2020 gives CSPs the digital arsenal to disrupt the digital marketplace competitive landscape, assessing inventories and consumer behaviors to predict and delivers goods according to dynamic market demands. CSPs delivering optimal customer experiences level the digital playing field to their favor, shifting competitive dynamics to their advantage. CSPs with imagination and prudent application, can harness AI to enhance every aspect of the customer engagement experience.



III. Broadening & Strengthening Digital Ecosystem Influence



Digital partners are onboarded using an intuitive portal, and full partner lifecycle management is provided including access to a centralized product catalog to deliver joint offerings, performance tracking to evaluate partner efficiency and reliability checks to ensure new markets are successfully covered.

Partner offers are made available in Netcracker's Digital Marketplace, which uses a unified product catalog to combine digital services with telco services.

Content and offerings can be dynamically personalized and quote configurations are driven by analytics. Enhancements include support for multiple partner-driven business models (B2B2X, resellers, suppliers, distributors, sponsorship and wholesale with flexible multiparty settlements).

Futurum Perspective:

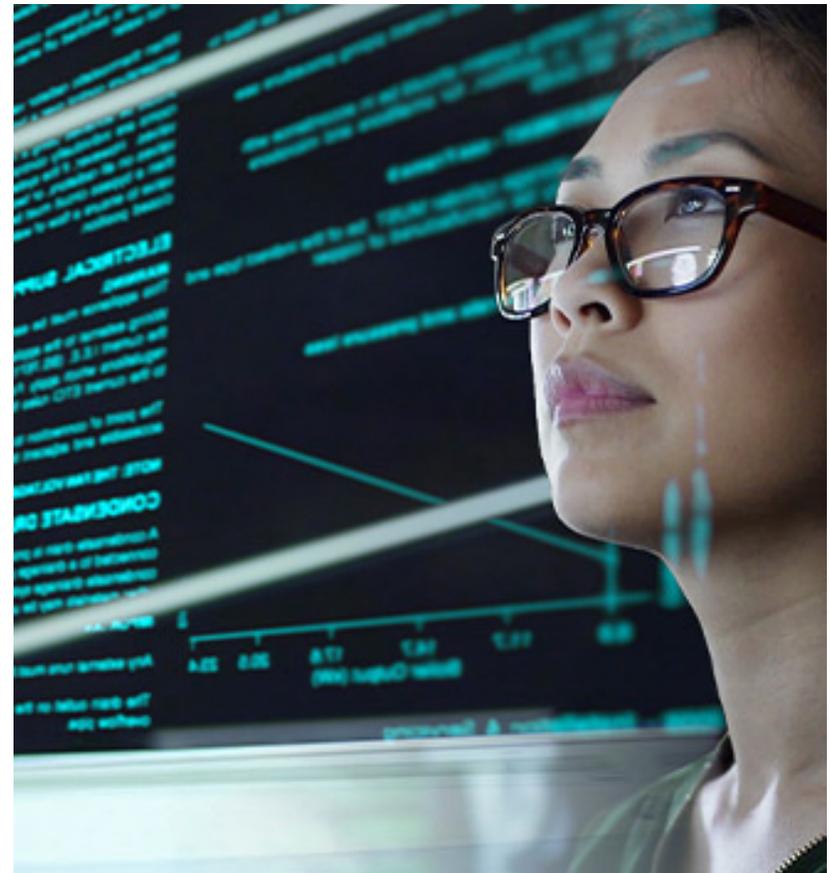
For CSPs, engaging the right partners involves cultivating relationships across the entire partnership lifecycle. This encompasses identifying partners that are the best fit to work with their CSP brand extending to areas such as recruitment, onboarding, training, and subsequently, activation, co-marketing, and of course, monetization.

Netcracker 2020 enables CSPs to dynamically manage their partnerships, including affiliates, mobile applications, influencers, or any other type of alliance. A powerful partner program is integral to attaining new markets in the 5G era, broadening digital ecosystem influence in the tightly contested global digital market.

Netcracker 2020 strengthens CSP recruitment and onboarding throughout their partnership-building journeys. It involves ensuring CSP partners are ready and willing to work with their brand and helping them to onboard with an efficient and mutually beneficial approach.

With Netcracker 2020, CSPs can hone their partnership communication strategy, developing smart and contextual marketing campaigns that maximize brand

promotion. CSPs need to use Netcracker's advanced analytics to better understand and measure their partners' performance and revenue goals in order to maximize the alliance's monetization opportunities while also minimizing costs and avoiding duplicate efforts.



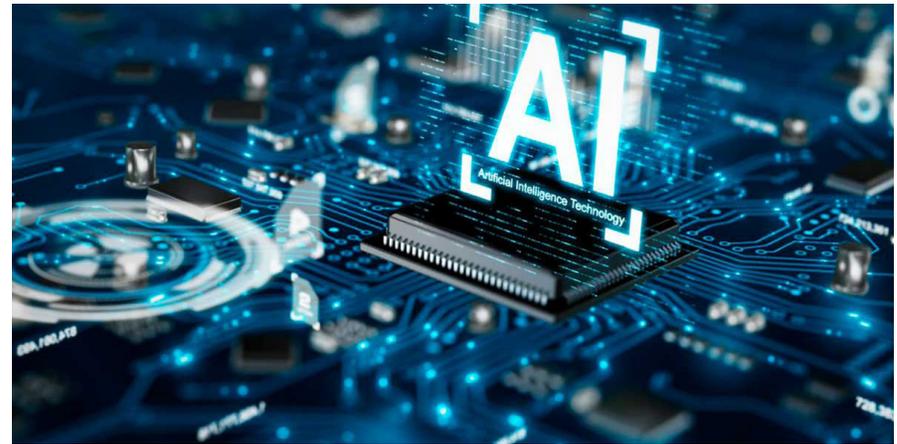
IV. The Critical Role of Advanced Analytics and AI

Netcracker 2020 includes a single, unified Advanced Analytics platform that delivers E2E visibility across the CSP's business and operations IT footprint, guaranteeing security, reusability, and fully automated analytics-driven processes. It provides the visual interface and full set of capabilities necessary for operation and management of all use cases.

Futurum Perspective:

Netcracker 2020 provides the unified Advanced Analytics platform CSPs need to proactively target dedicated business processes, solutions, or services to make smart decisions. Today advanced analytics engines are not only describing, diagnosing, predicting, or even recommending the best actions, but are also initiating those actions automatically. As a result, it becomes imperative for CSPs to harness Netcracker Advanced Analytics in areas such as proactive decisioning in order to optimize their digital interactions and transactions, rendering customer experiences preeminent and personal and securing long-term competitive advantages.

For CSPs to get the most from their advanced analytics and AI resources, Netcracker 2020's holistic visualization and exploration tools are indispensable. The portfolio's advanced analytics make customer experience actionable by directly linking customer



experiences to revenue, profitability, and other key metrics on which to measure business outcomes.

Moreover, Netcracker 2020 incorporates advanced analytics and AI to bolster network and service operations, providing the means for CSPs to execute smarter, data-driven business decisions. Using the portfolio's advanced analytics, CSPs can prevent service disruptions and avoid service level agreement (SLA) penalties.

Overall Netcracker's Advanced Analytics eases CSP transitioning from manual operations and business processes to automated implementations. Advanced analytics, in alignment with AI engines, are integral to attaining the automated operations that power self-configuring and self-optimizing networks.

V. Assuring Overall CSP Security

Integral to Netcracker 2020 is Netcracker Enhanced Security, a holistic, multi-pronged framework of security solutions and services that supports capabilities designed to ensure that the entire lifecycle of developing, delivering, and operating BSS and OSS platforms is secure. These capabilities include secure development processes, secure integration APIs, control and monitoring of platform access through a secure enclave infrastructure, strict change control policies and strong governance, including access control, frequent audits and regular security testing. Moreover, Netcracker Enhanced Security controls how and where data is stored and accessed, enables anonymization of sensitive data, and is engineered to prohibit unauthorized access.

Futurum Perspective:

Emerging 5G use cases and digital transformation journeys are introducing security challenges that can only be resolved by end-to-end (E2E) implementations. Netcracker Enhanced Security provides the comprehensive blueprint service providers must have in order to deal with new challenges that include distributing more services and content to the network edge, proliferation of IoT devices, and massive

bandwidth increases accompanied by new ultra-low latency. We anticipate speed and thoroughness in detecting 5G security threats takes on paramount importance such as reducing the amount of time attacks go undetected.

We believe Netcracker Enhanced Security delivers the E2E security required in 5G and multi-cloud environments and is key to enabling the layered in-depth defense of the network encompassing the network and cloud infrastructure, network functions, and network slices and services layers under unified orchestration and management. The solution also provides the predictive techniques critical to preventing security breaches and disruption, as well as accelerated detection of security violations. By deploying massively scalable controls at the edge in combination with advanced analytics and adaptable AI security capabilities, service providers have the security framework required to automate and adapt the E2E security best suited for their own networks, including critical infrastructure, as well as fulfilling their enterprise customers' 5G security demands.

VI. Conclusions and Takeaways

Netcracker 2020 is answering the CSP clarion call for a digital portfolio that is purpose-developed for swiftly meeting the unique demands of the 5G-IoT epoch and global digital ecosystem. Netcracker's portfolio is redesigned and upgraded to accelerate the top-priority transformation goals of CSPs including personalization of digital services, optimization of B2B engagements, secure multi-cloud flexibility, agile

partner management, as well as inclusion of advanced analytics and AI that are key to powering broader automation and intelligent operations. By adopting Netcracker 2020, CSPs are unequivocally positioned to play a far more strategic and influential role across the worldwide digital value chain.



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ABOUT NETCRACKER

Netcracker was founded in 1993 and has been a wholly-owned subsidiary of NEC Corporation since 2008. Driven by its focus on R&D, Netcracker's end-to-end portfolio of BSS, OSS and Customer Engagement products and related professional services enable telecommunications and cable service providers, utilities, financial services, logistics, and other business services providers

to transform their mission-critical back office and front office processes. Netcracker offers an extensive range of solutions for digital service providers, such as business service innovation, 5G and digital service monetization, IT transformation and hybrid network operations.

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