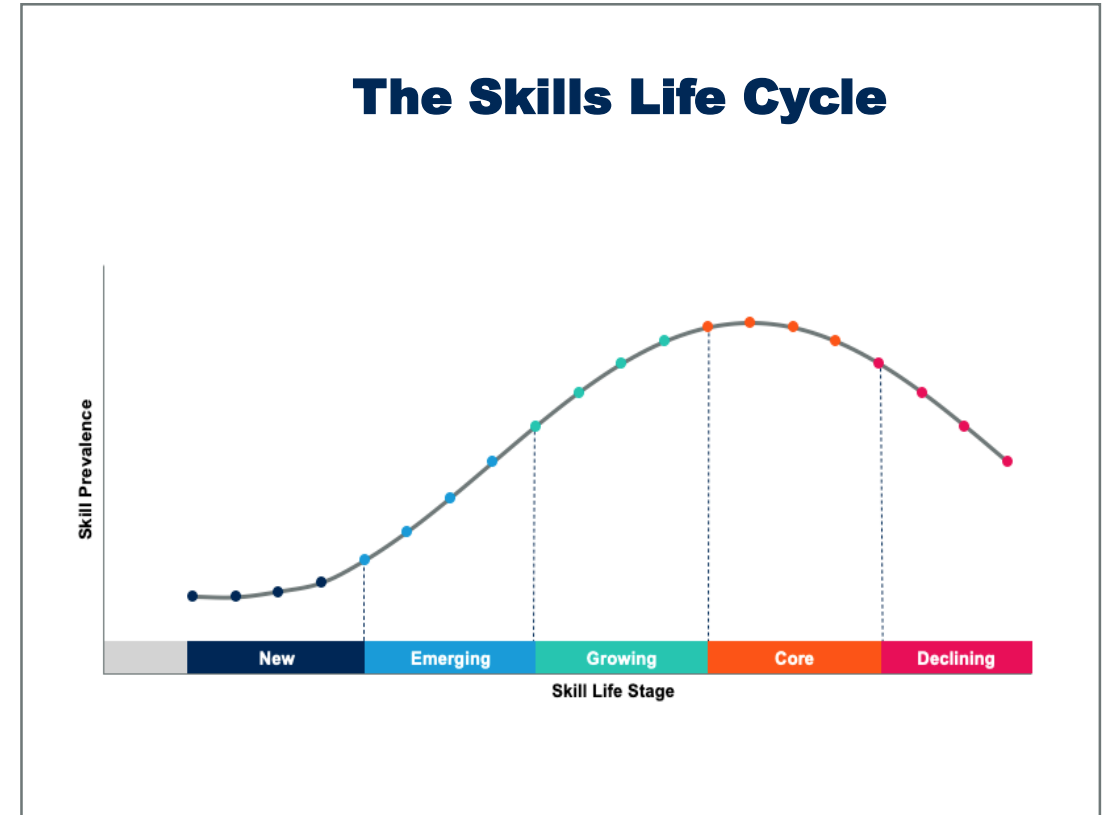


The Skills Life Cycle for Top IT Roles

What Skills Are Leading
Companies Prioritizing?

Purpose of the Skills Life Cycle

- **Why the Skills Life Cycle?** It's hard to know which skills to invest more or less in, especially when skills are evolving so quickly now.
- The Skills Life Cycle helps you understand how skills are changing in a given role over time to help inform skill resource investment decisions.
- Each Skills Life Cycle will show which skills leading companies (and other companies for comparison) are looking for in job postings for a given role and how that is changing, which skills are increasingly being sought, and which are declining. We define leading companies as FAANG+^a companies for the purposes of this report.



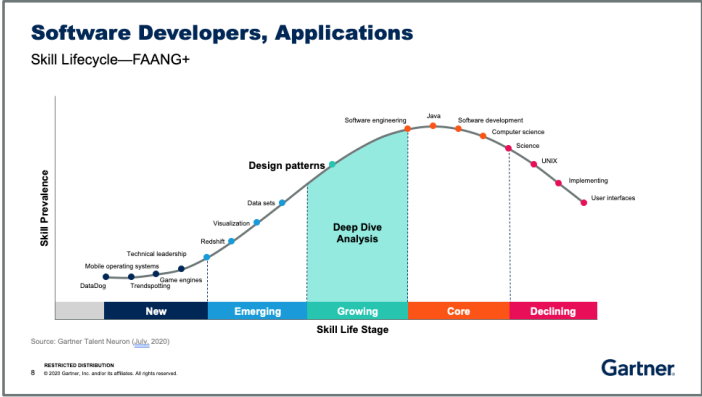
^a "FAANG+" is an acronym that refers to the stocks of five prominent, top performing, American technology companies: Facebook (FB), Amazon (AMZN), Apple (AAPL), Netflix (NFLX); Google and Microsoft.

Table of Contents

- [Guidance for Reading the Skills Life Cycle](#)
- [Software Developers, Applications](#)
- [Computer Systems Engineers/Architects](#)
- [Network and Computer Systems Administrators](#)
- [Computer and Information Systems Managers](#)
- [Information Security Analysts](#)
- [Appendix](#)

Guidance for Reading the Skills Life Cycle

How to Read ‘The Skills Life Cycle’



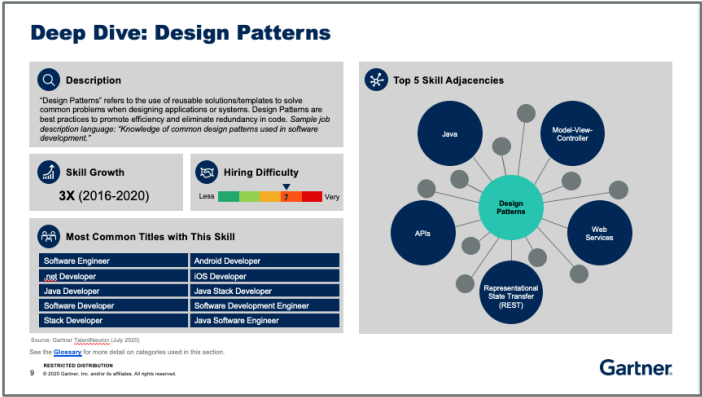
The Skills Life Cycle

Vertical Axis

- Skill prevalence represents how often a skill appears in job postings for a particular role. The more a skill appears, the more we can assume that skill is important to the duties of that role.

Horizontal Axis

- The calculation of each category along the bottom is a combination of prevalence of skills throughout a four-year period and how those skills have either grown or declined in that period.
- Some categories have more skills than others. Skills have to meet a certain criteria to qualify for inclusion (this is not a list of all skills required for a role).
- Skills will differ by organization, e.g. FAANG+ company declining skills may still be present in core roles for the average organization.



Deep Dive

The skills life Cycle graphic is followed by a “deep dive” look at the skills that fall within the highlighted “**Growing**” category. We have focused on the ‘Growing’ category, as that is likely the point at which organizations will want to start taking action with regard to a given skill. The deep dive section is intended to provide additional input as organizations consider their ‘build, buy, borrow’ options for the skill in question.



Skills Life Cycle Definitions

Below we include some guidance around what kind of action you may want to consider taking with regard to the skills in each category. This is intended as directional guidance only; decisions will depend on the individual circumstances of each organization.

	New	Emerging	Growing	Core	Declining
Definition ^a	New skills that could become important, but their future is uncertain. These skills were almost never found in job postings a few years ago, but they are now starting to appear.	Relatively new skills that were in a small percentage of job postings a few years ago but have increased enough to catch our attention.	Skills with high growth that are on the way to become core skills. These are the skills that used to be optional but are now becoming increasingly important to the talent profile.	Skills that are essentials for the job. They are present in a high percentage of job postings and have been for a while.	Skills with a high rate of decrease that used to be more prevalent but now appear in a lower percentage of job postings.
Suggested Action	Nothing for now. Market leaders might be exploring these skills for this role but that could quickly change (either with an increase or decrease in interest in the roles).	Take note and set a plan to upskill (or recruit) talent in these skills in the near future. Very often these skills are being embraced by market leaders as the role evolves. Availability of these skills is likely low, driving up competition and costs. Market leaders are more likely able to afford them and thus drive demand.	Adjust current hiring and upskilling strategy to incorporate these skills. Organizations not focusing on these skills for the role are at risk of falling behind. These skills are driving the evolution of the role.	Continue upskilling and hiring. Most organizations should be recruiting for these skills for a given role. Organizations not recruiting these skills for a given role are already behind and should consider adjusting hiring and upskilling strategies.	Begin to consider deprioritizing these skills for the role. While these skills are still important to the role, they will become less relevant in the near future. Significant investment in these skills is not advised. Identify talent segments at risk of becoming redundant as a result of possession of declining skills, to determine options for reskilling them.

^a The categories are mutually exclusive but not collectively exhaustive, meaning a skill cannot belong in more than one category, but doesn't have to be in one of them.

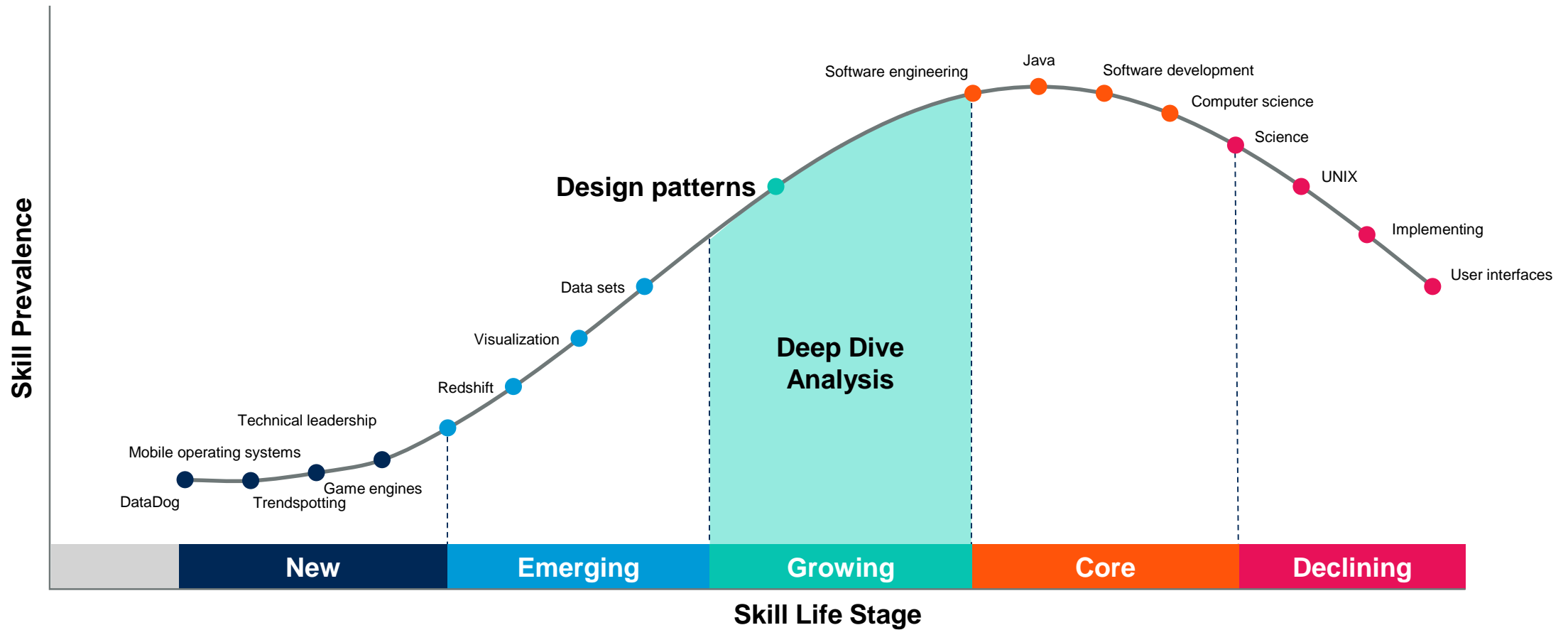


Software Developers, Applications



Software Developers, Applications

Skills Life Cycle—FAANG+



Source: Gartner Talent Neuron (July, 2020)

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Deep Dive: Design Patterns

Description

“Design patterns” refers to the use of reusable solutions/templates to solve common problems when designing applications or systems. Design patterns are best practices to promote efficiency and eliminate redundancy in code. *Sample job description language: “Knowledge of common design patterns used in software development.”*

Skill Growth

3X (2016-2020)

Hiring Difficulty



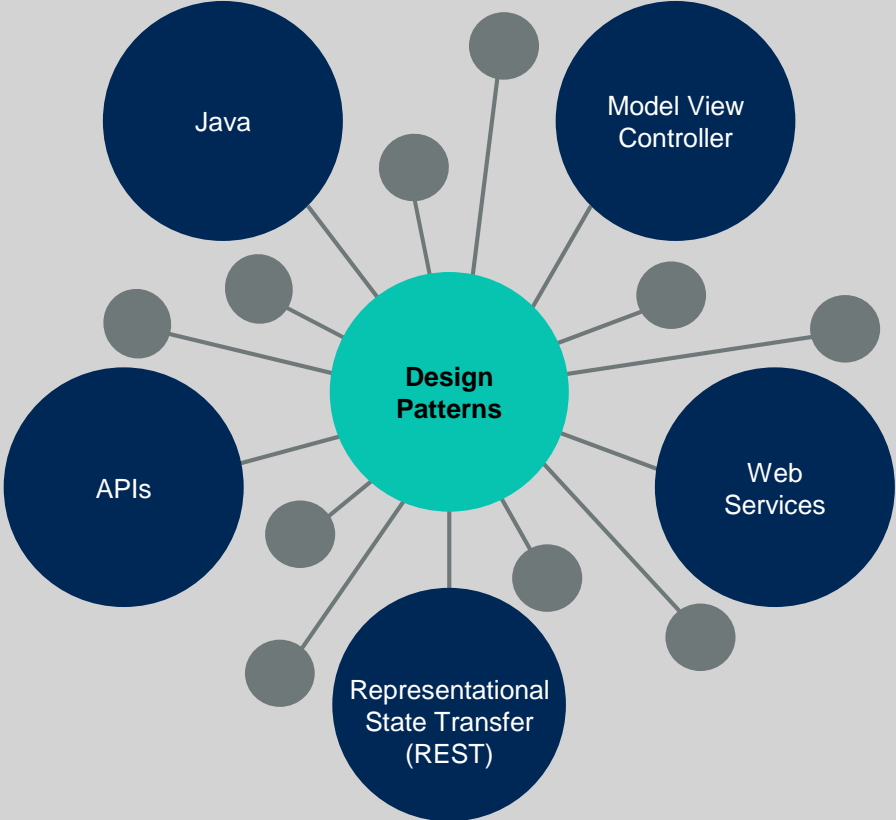
Most Common Titles With This Skill

Software Engineer	Android Developer
.net Developer	iOS Developer
Java Developer	Java Stack Developer
Software Developer	Software Development Engineer
Stack Developer	Java Software Engineer

Source: Gartner TalentNeuron (July 2020)

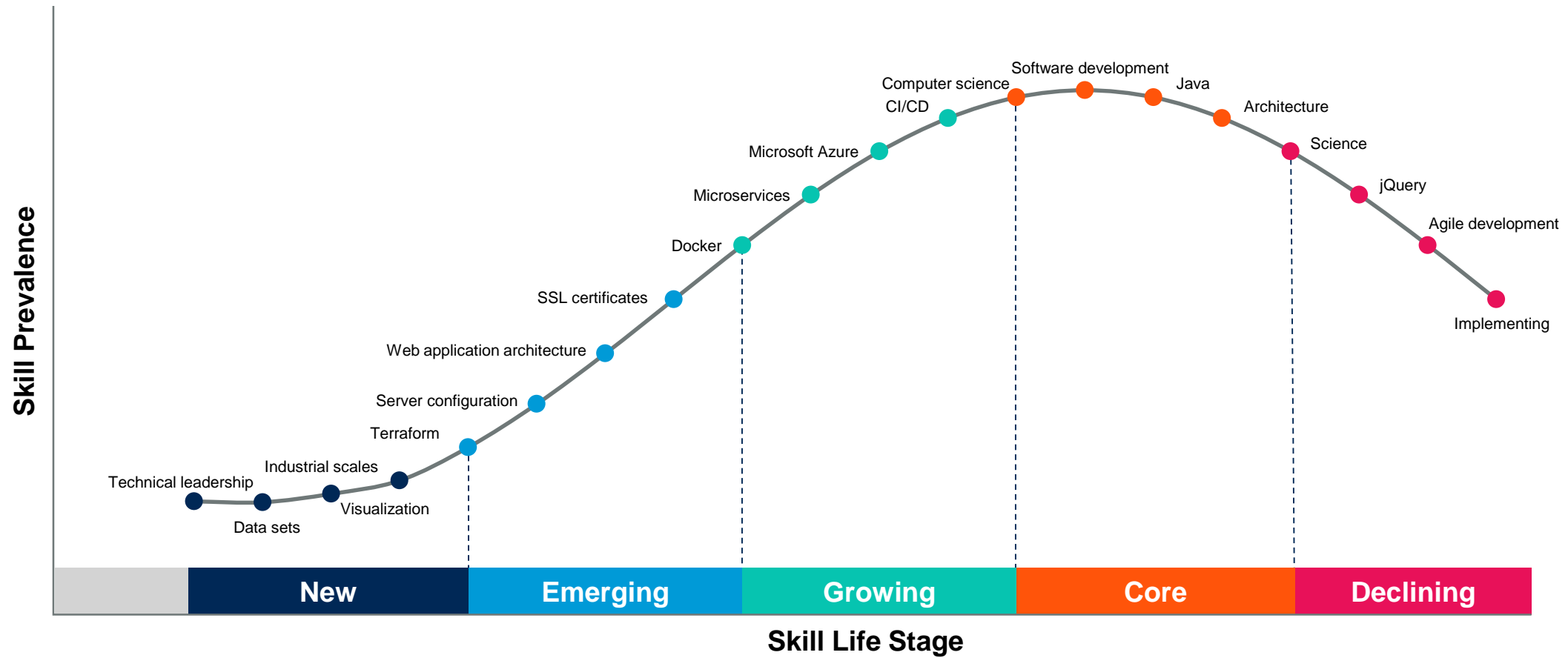
See the [Glossary](#) for more detail on categories used in this section.

Top Five Skill Adjacencies



Software Developers, Applications

Skills Life Cycle—Non FAANG+



Source: Gartner Talent Neuron (July, 2020)

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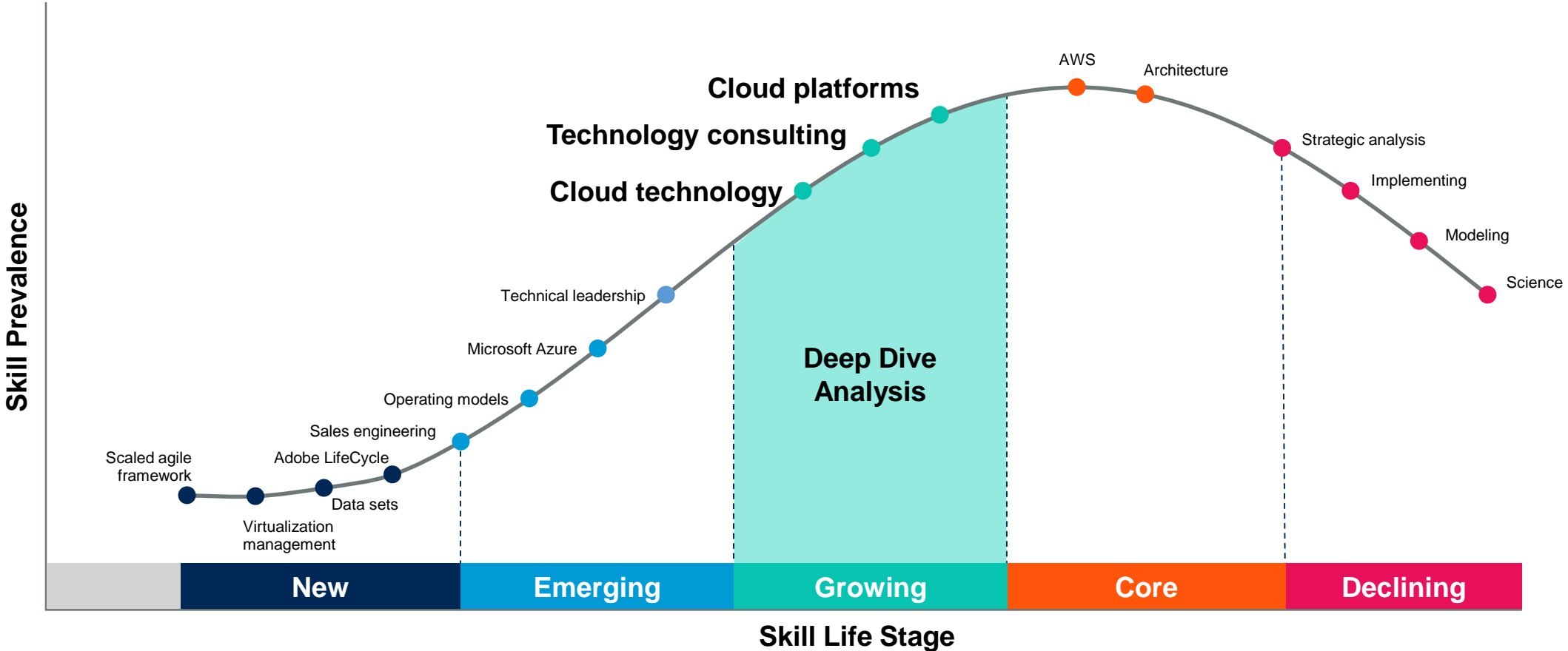
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Computer Systems Engineers/ Architects

Computer Systems Engineers/Architects

Skills Life Cycle—FAANG+



Source: Gartner Talent Neuron (July, 2020)



Deep Dive: Cloud Platforms



Description

“Cloud platforms” refers to the software infrastructure for a cloud computing service. Cloud platforms or “clouds” can be public, private, or hybrid. *Sample job description language: Experience helping global customers architect SAP integration scenarios with cloud platforms.*



Skill Growth

4.6X (2016-2020)



Hiring Difficulty

Less 9 Very



Most Common Titles With This Skill

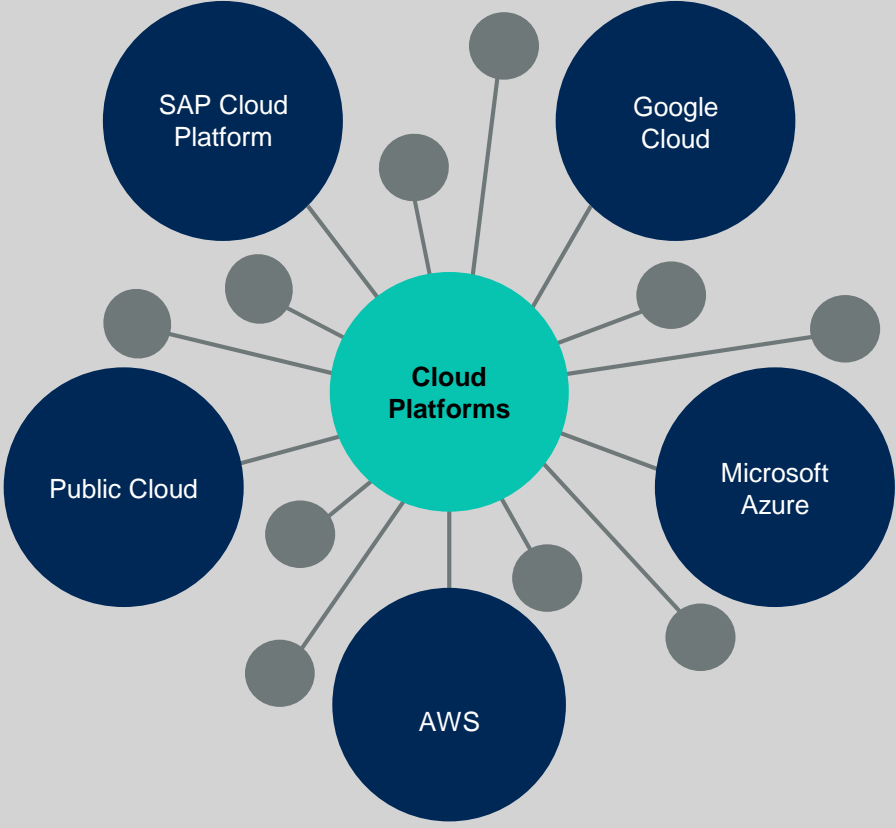
Cloud Architect	Azure Architect
Solutions Architect	Cloud Solutions Architect
Data Architect	Senior Manager Secop Engineering
Cloud Engineer	Cloud Salesforce Technical Architect
Enterprise Architect	Architect

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.



Top Five Skill Adjacencies



Deep Dive: Technology Consulting

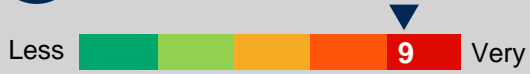
🔍 Description

“Technology consulting” refers to experience working with clients to help them utilize digital technologies, processes, or systems to achieve business goals.
Sample job description language: At least 3 years of experience in technology consulting, enterprise and solutions architecture and architectural frameworks in Web analytics/JavaScript solutions.

📈 Skill Growth

2.9X (2016-2020)

📊 Hiring Difficulty



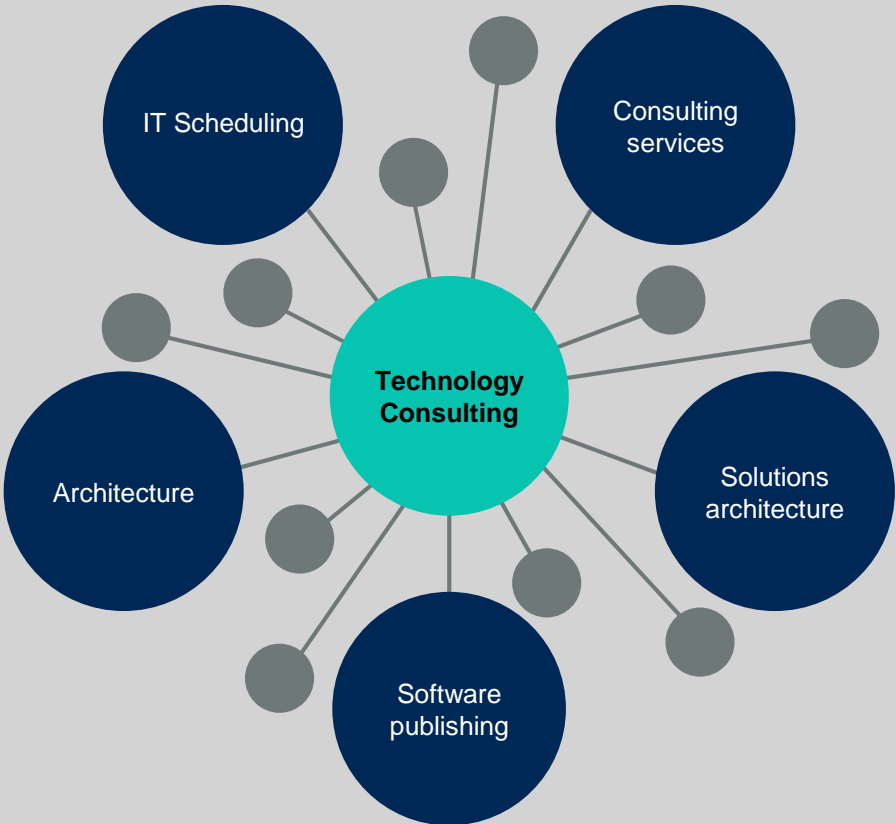
👥 Most Common Titles With This Skill

Technology Architect	Cloud Architect
Solutions Architect	Solutions Architect HPE
Data Architect	Customer Delivery Architect
Systems Engineer	Big Data Architect
Enterprise Architect	Cloud Consultant

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

🔗 Top Five Skill Adjacencies



Deep Dive: Cloud Technology

Description

“Cloud technology” refers to the technologies that enable cloud computing services by providing access to storage, files, software, and services via the internet.
Sample job description language: Partner with key stakeholders to promote a unified vision and strategy for the adoption of cloud technologies.

Skill Growth

2.6X (2016-2020)

Hiring Difficulty



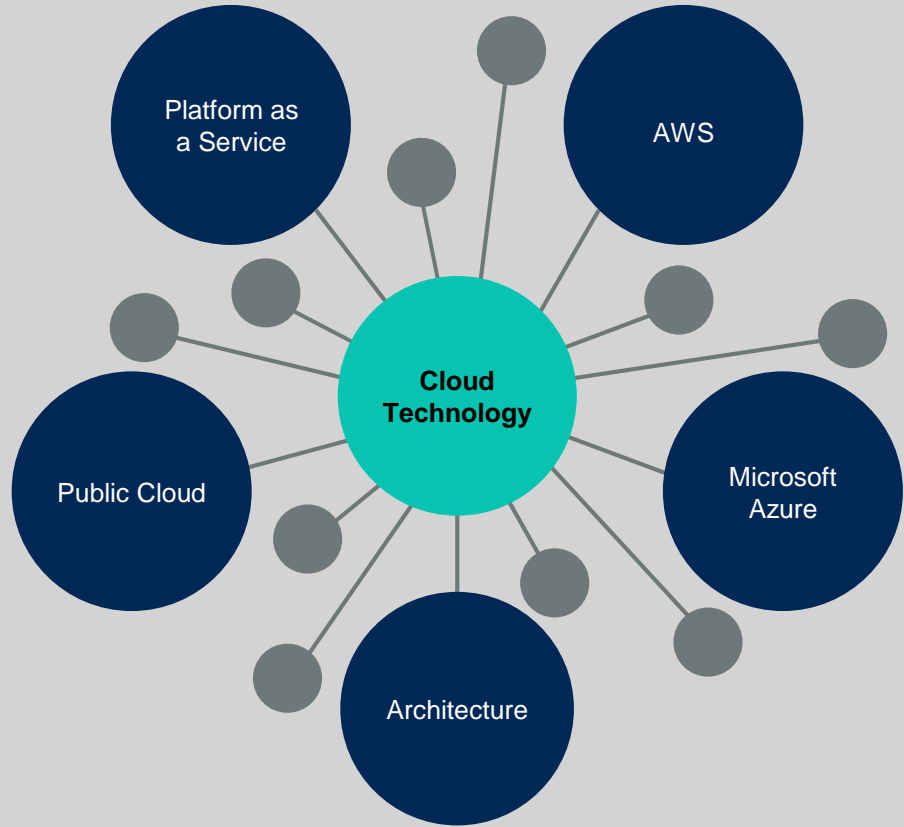
Most Common Titles With This Skill

Cloud Architect	Systems Engineer
Solutions Architect	Cloud Solutions Architect
Enterprise Architect	Architect
Data Architect	Senior Principal Big Data Architect
Cloud Engineer	Infrastructure Architect

Source: Gartner TalentNeuron (July 2020)

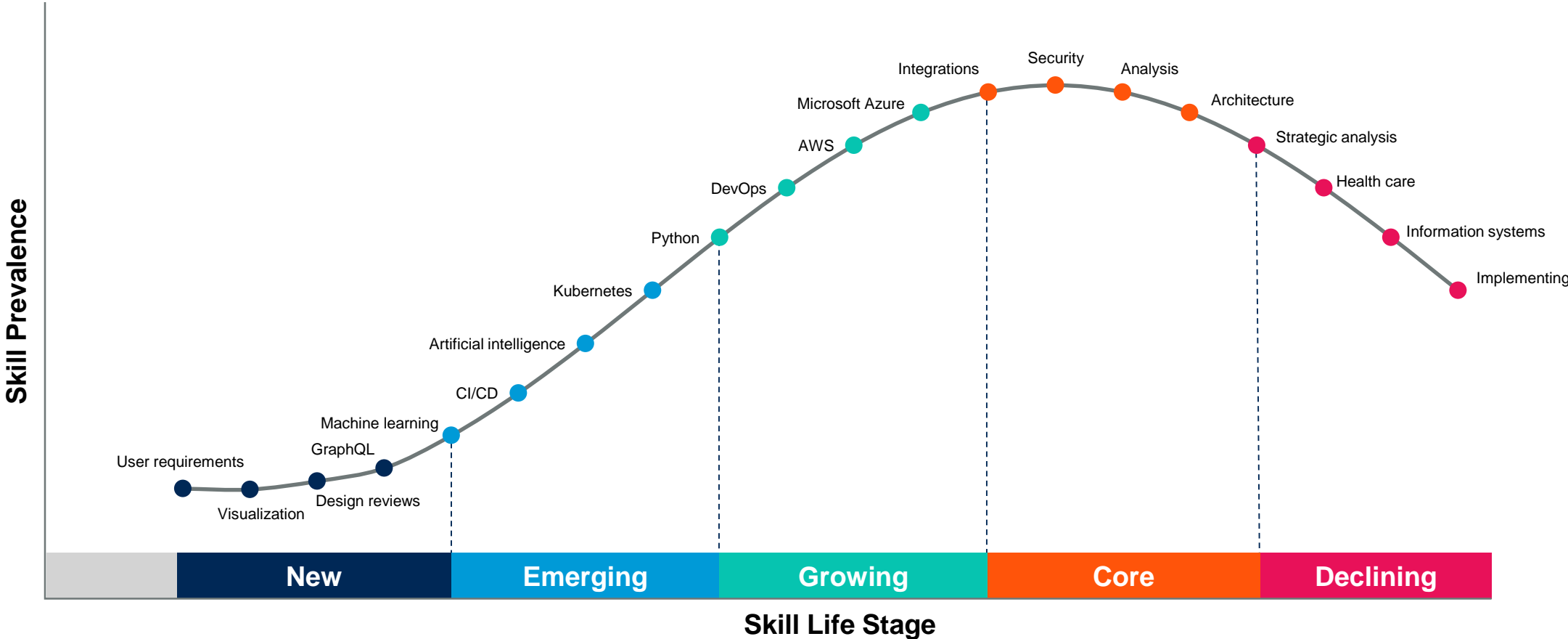
See the [Glossary](#) for more detail on categories used in this section.

Top Five Skill Adjacencies



Computer Systems Engineers/Architects

Skills Life Cycle—Non FAANG+

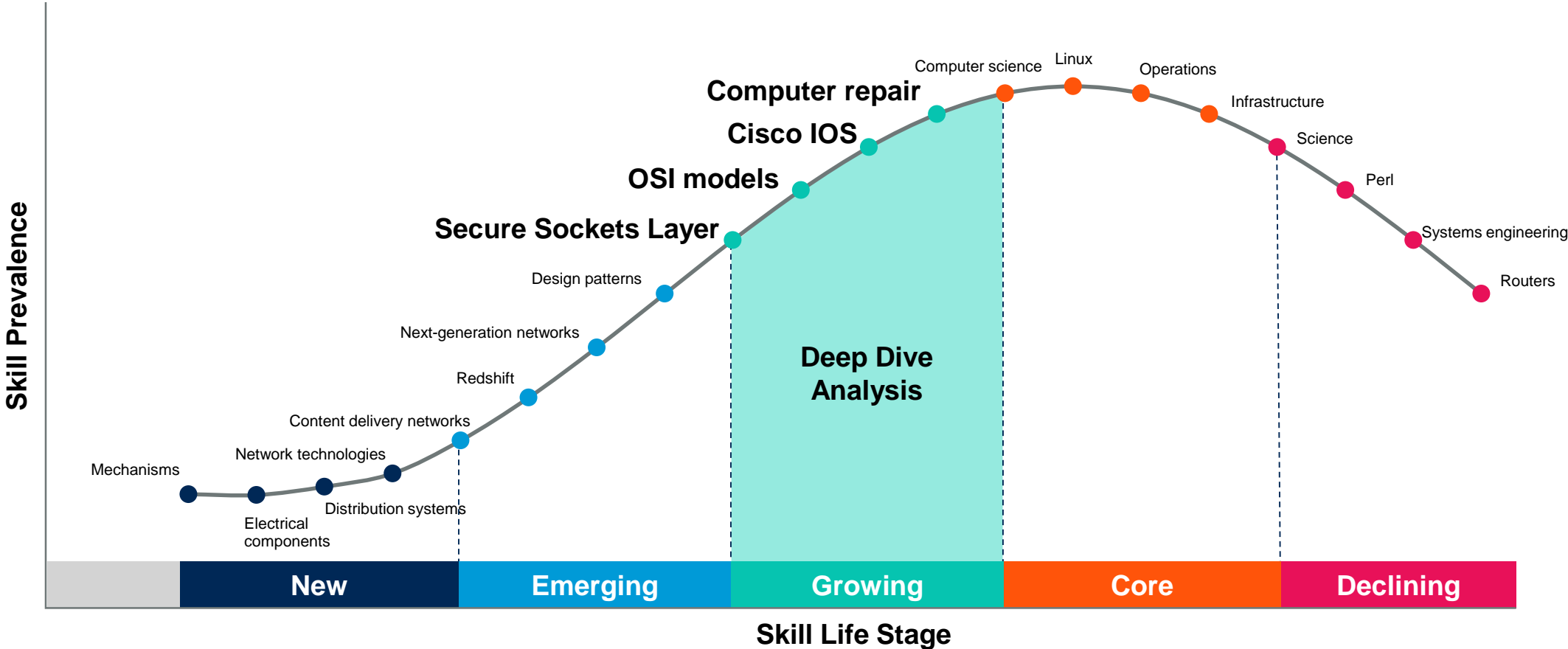


Source: Gartner Talent Neuron (July, 2020)

Network and Computer Systems Administrators

Network and Computer Systems Administrators

Skills Life Cycle—FAANG+



Source: Gartner Talent Neuron (July, 2020)

Deep Dive: Computer Repair

Description

“Computer repair” refers to the diagnosis, troubleshooting, and repair of computer hardware and software problems. *Sample job description language: 2+ years of experience in PC repair, troubleshooting, deployment, and liquidation.*

Skill Growth

3.1X (2016-2020)

Hiring Difficulty

Less  10 Very

Most Common Titles With This Skill

IT Support Engineer	Operations Engineer ESS Engineering I
System Administrator	Senior Systems Technician
Network Technician	Lan Wan Support Specialist
IT Network Engineer TSA Security Systems	Lead Systems Technician
Network Administrator	IT System Administrator

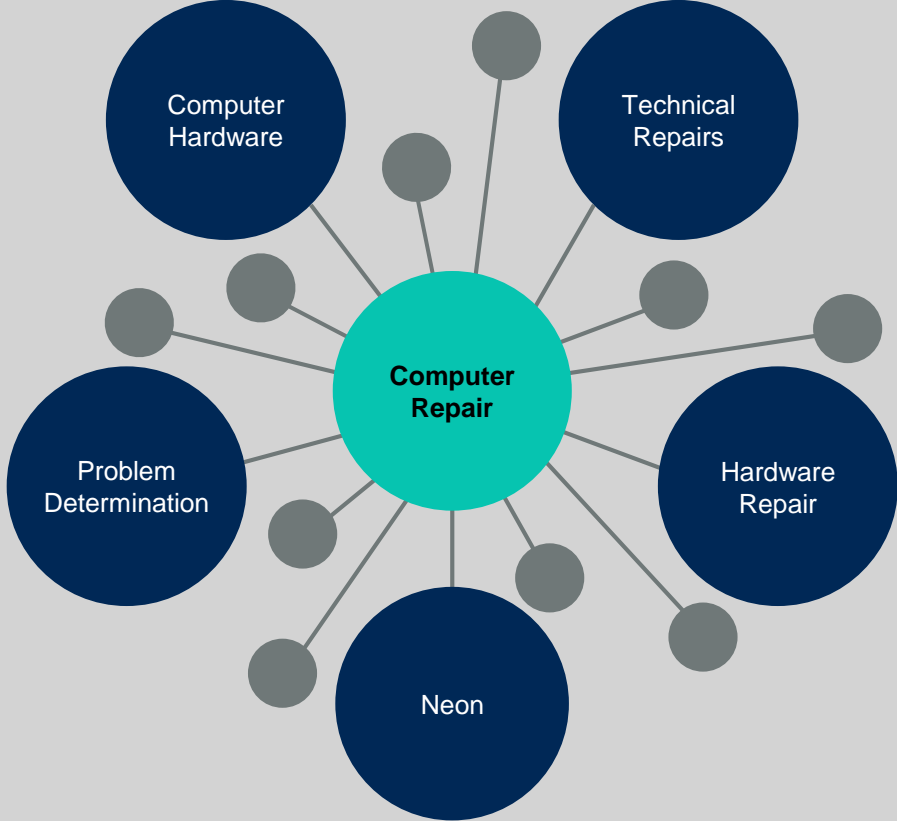
Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

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Top Five Skill Adjacencies



Deep Dive: Cisco IOS (Internetwork Operating System)

Description

“Cisco IOS” refers to a family of network operating systems used on Cisco routers and switches, serving as the primary interface between the user and the hardware. *Sample job description language: Minimum 5 years’ experience in the following: - Cisco IOS-Based Switches to include Cisco Catalyst 6500, 4500, 3750 and 3560 series.*

Skill Growth

2.3X (2016-2020)

Hiring Difficulty



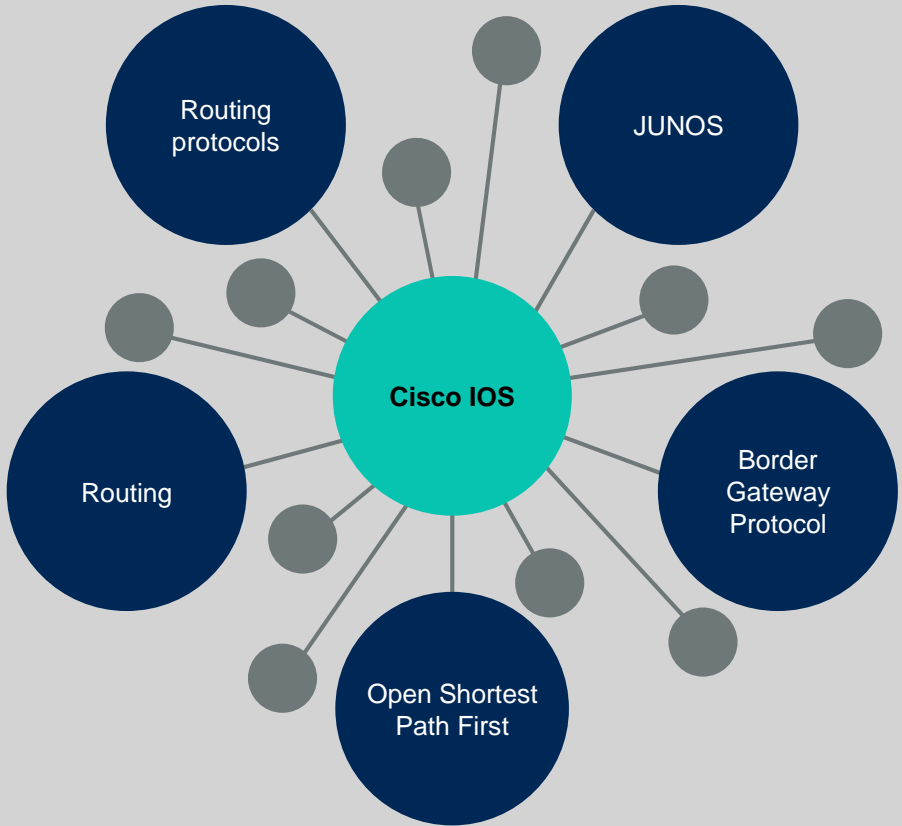
Most Common Titles With This Skill

Network Engineer	Network Operations Engineer
Network Administrator	System Engineer
System Administrator	Network Engineer System Administrator
IT Support Engineer	Network Technician
Cisco Network Engineer	Data Network Engineer

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

Top Five Skill Adjacencies



Deep Dive: OSI Models

Description

Synthesis: "OSI Models" or "Open Systems Interconnection Models" is a conceptual and logical layout that defines network communication used by systems open to interconnection and communication with other systems. *Sample job description language: 2+ years or experience with networking concepts such as DNS, DHCP, SSL, OSI Models, and TCP/IP.*

Skill Growth

2.1X (2016-2020)

Hiring Difficulty



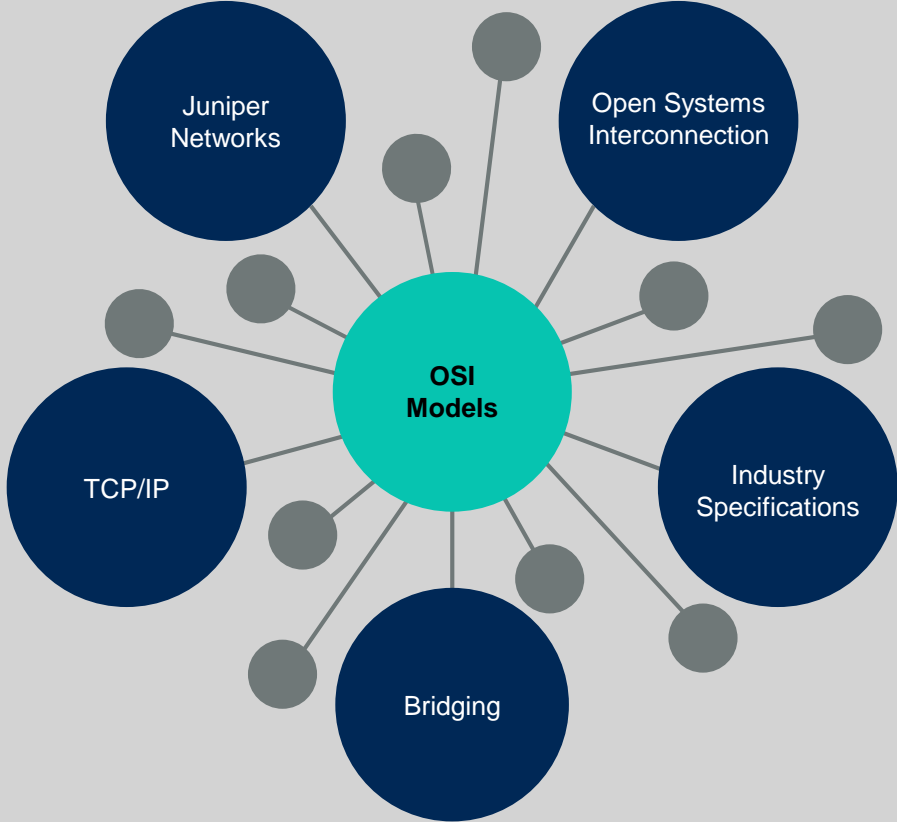
Most Common Titles With This Skill

Network Engineer	IT Service Delivery Representative
Network Specialist	System Administrator
IT Support Engineer	Network Technician
Network Administrator	System Engineer
Data Center Technician	Core Network Engineer

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

Top Five Skill Adjacencies



Deep Dive: Secure Sockets Layer

Description

“Secure sockets layer” or “SSL” is a standard security technology used for encryption and transfer of information over a network. *Sample job description language: Experience maintaining wide area networks utilizing MPLS, DMVPN, SSL VPN.*

Skill Growth

2.1X (2016-2020)

Hiring Difficulty



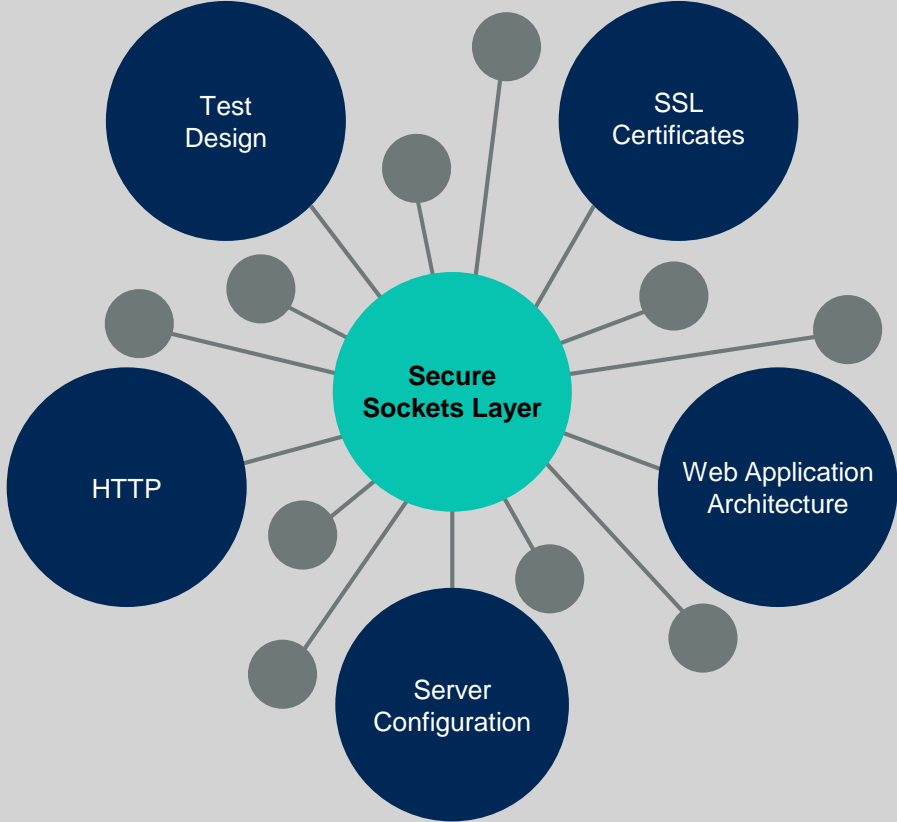
Most Common Titles With This Skill

Network Engineer	IT Support Engineer
System Administrator	Linux System Administrator
Systems Engineer	Websphere Administrator
Network Administrator	Technical Support Engineer
DevOps Engineer	Engineer

Source: Gartner TalentNeuron (July 2020)

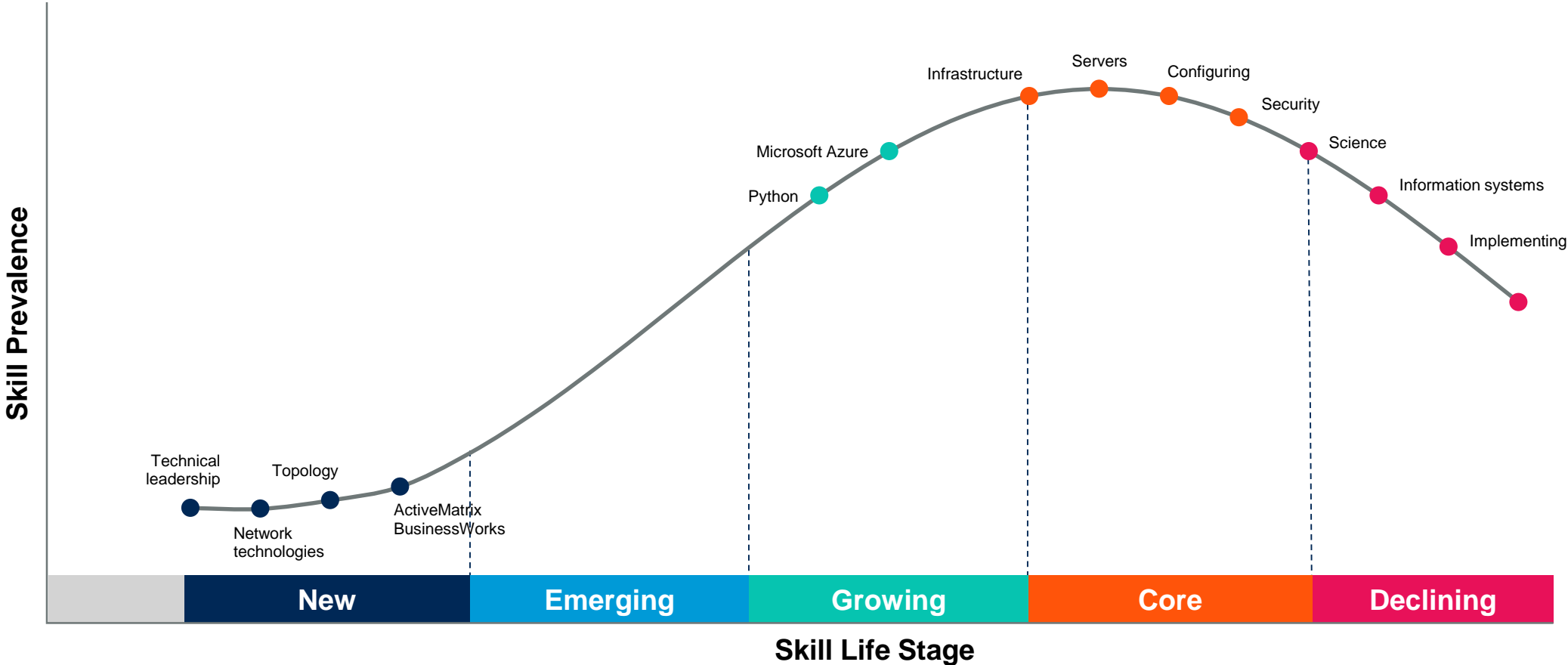
See the [Glossary](#) for more detail on categories used in this section.

Top Five Skill Adjacencies



Network and Computer Systems Administrators

Skills Life Cycle—Non FAANG+

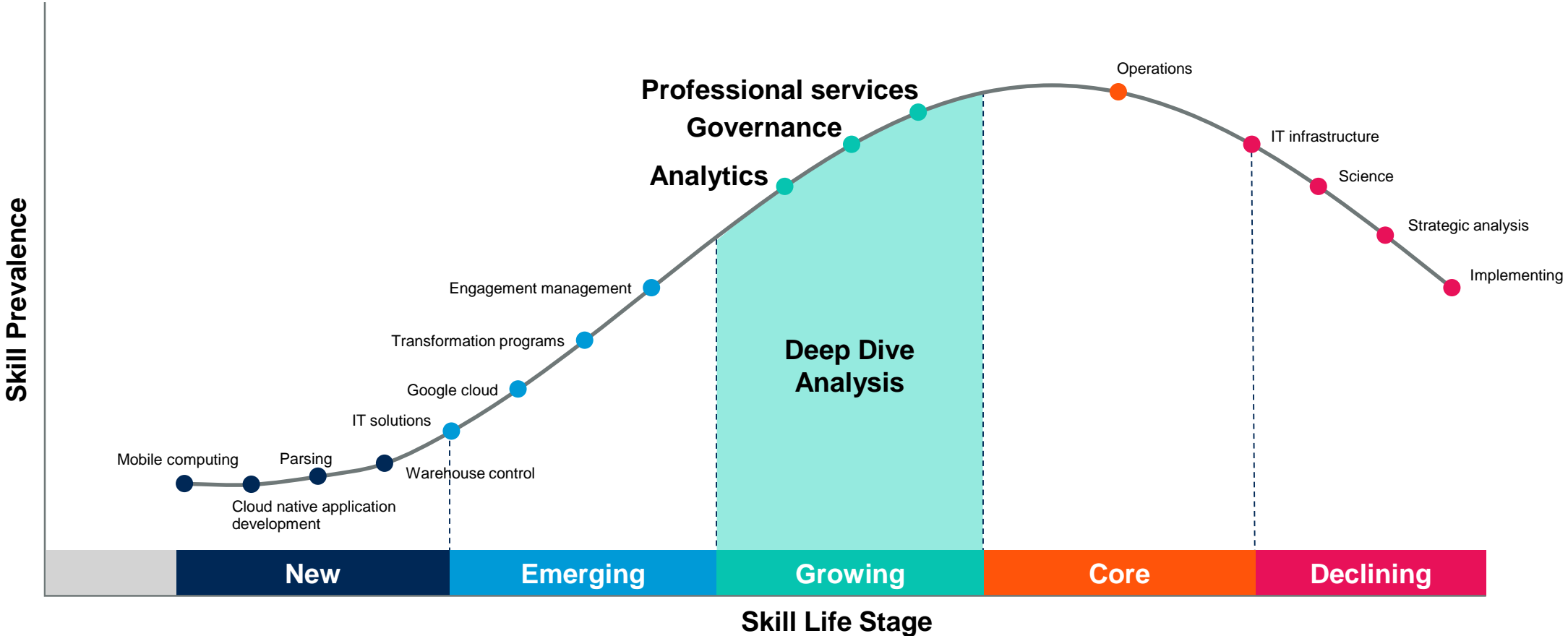


Source: Gartner Talent Neuron (July, 2020)

Computer and Information Systems Managers

Computer and Information Systems Managers

Skills Life Cycle—FAANG+



Source: Gartner Talent Neuron (July, 2020)

Deep Dive: Professional Services



Description

“Professional services” refers to the intangible set of services offered to a client to manage a specific part of their business (such as law, marketing, and accounting).
Sample job description language: Develop a long-term Professional Services strategy and execute that strategy with those customers.



Skill Growth

2.8X (2016-2020)



Hiring Difficulty

Less **8** Very



Most Common Titles With This Skill

Customer Practice Manager	Director Execution Service Open Solutions
IT Manager	Managing Director Telecommunications
Program Manager	Director Information Technology
Director Engagement	Engagement Management Director ERP Implementation Service
Service Delivery Manager	Engineer

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.



Top Five Skill Adjacencies



Deep Dive: Governance



Description

“Governance” refers to the rules practices and processes that govern decisions and actions. In an IT context, governance often refers to the management of resources, or the organization and use of data. *Sample job description language: Lead security operations, data governance and disaster recovery programs, working with external vCISO resources as necessary.*



Skill Growth

2.8X (2016-2020)



Hiring Difficulty

Less **5** Very



Most Common Titles With This Skill

Director Information Technology	Program Manager
IT Manager	Executive Director Cybersecurity Operations Policy
Data Governance Manager	Chief Information Security Officer
Chief Information Officer	IT Audit Manager
Director Information Security	Director Data Governance

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.



Top Five Skill Adjacencies



Deep Dive: Analytics



Description

“Analytics” or “data analytics” refers to the process of transforming qualitative and quantitative data into insights that can inform business decisions. *Sample job description language: Deep technical expertise in data science, analytics, or related fields.*



Skill Growth

1.6X (2016-2020)



Hiring Difficulty

Less 6 Very



Most Common Titles With This Skill

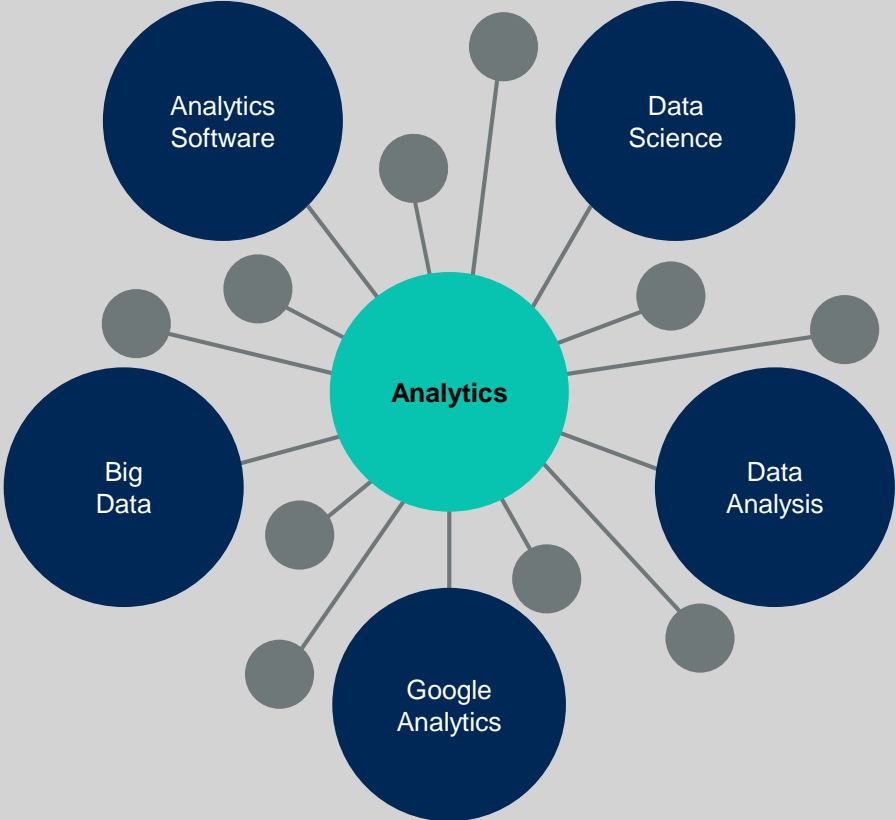
Director Data Analytics	Sap Consulting Director
Director Information Technology	Director Business Intelligence
Manager Data Analytics	Director Software Engineering
IT Manager	Chief Information Officer
Program Manager	Chief Technology Officer

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

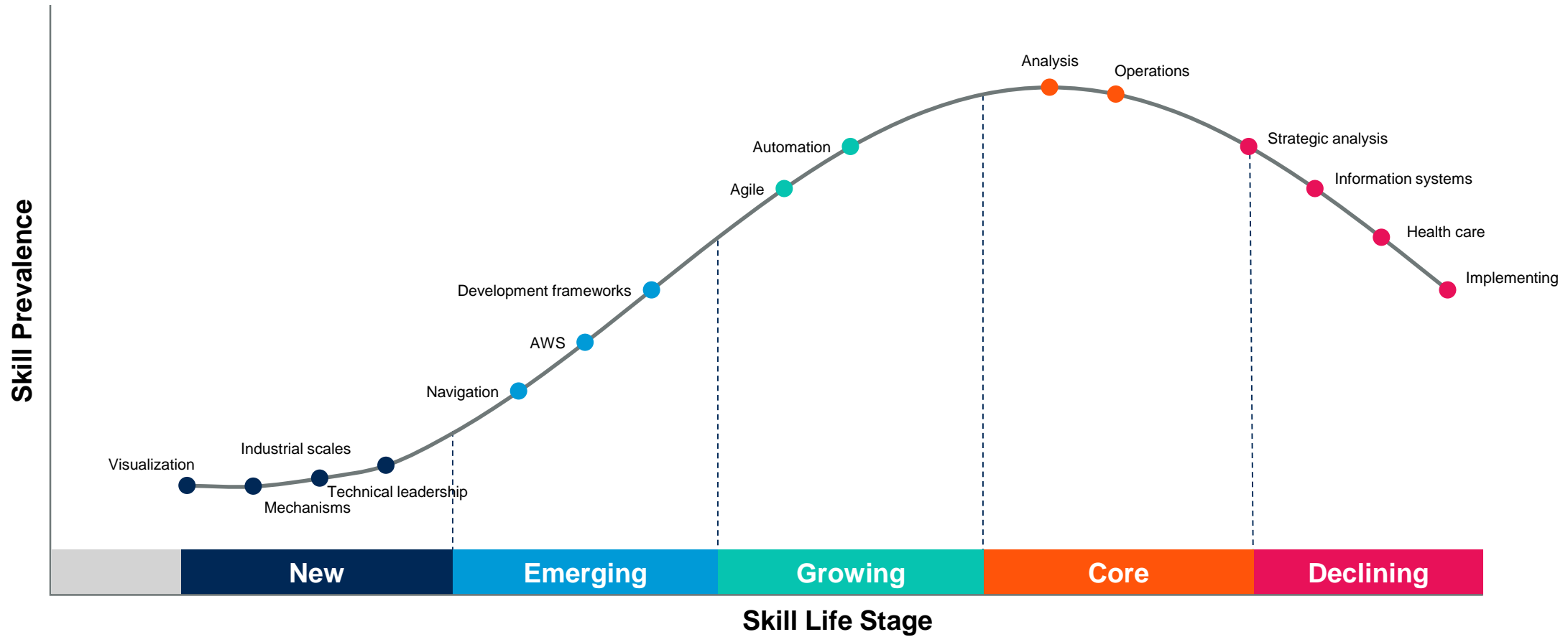


Top Five Skill Adjacencies



Computer and Information Systems Manager

Skills Life Cycle—Non FAANG+

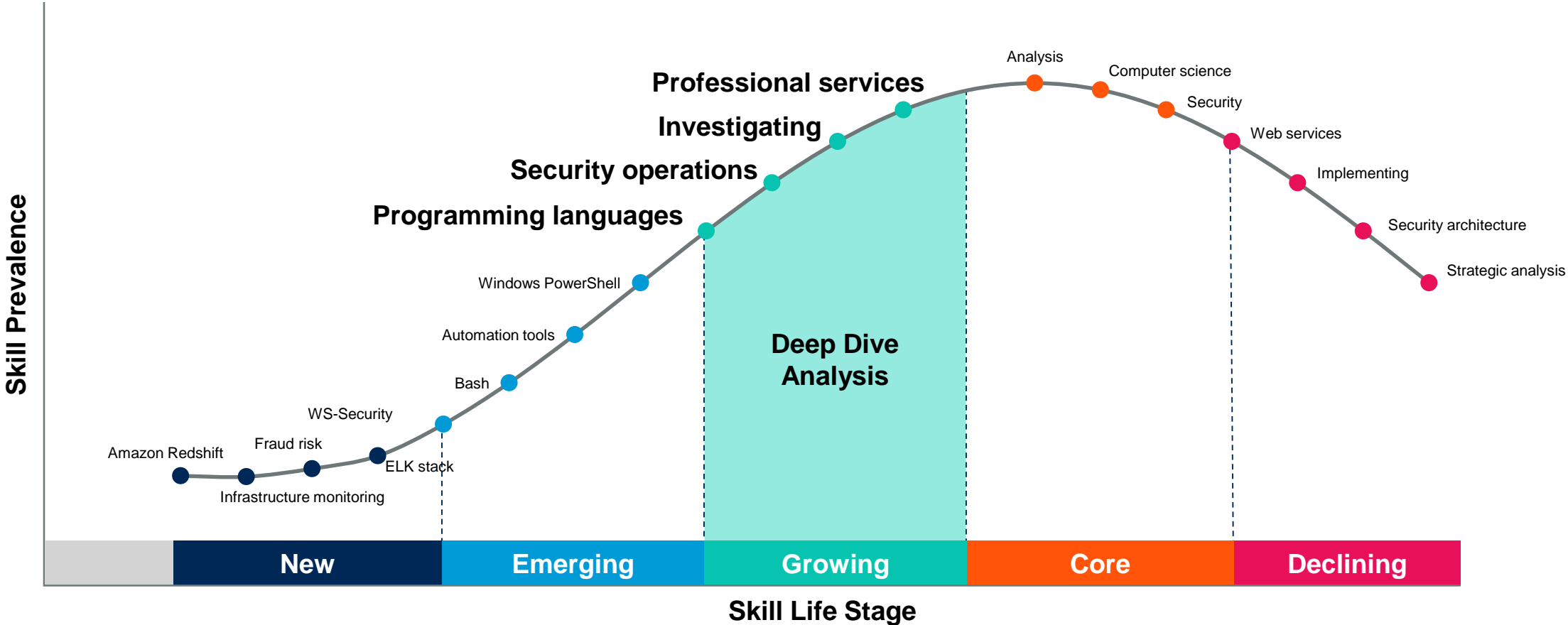


Source: Gartner Talent Neuron (July, 2020)

Information Security Analysts

Information Security Analysts

Skills Life Cycle—FAANG+



Source: Gartner Talent Neuron (July, 2020)



Deep Dive: Professional Services

🔍 Description

“Professional services” refers to the intangible set of services offered to a client to manage a specific part of their business (such as law, marketing, and accounting). *Sample job description language: Oversee vendor relationship for applicable third-party vendors providing service delivery of GRC-related functions to include, but not limited to, vendor management, security awareness and professional services.*

📈 Skill Growth

8.1X (2016-2020)

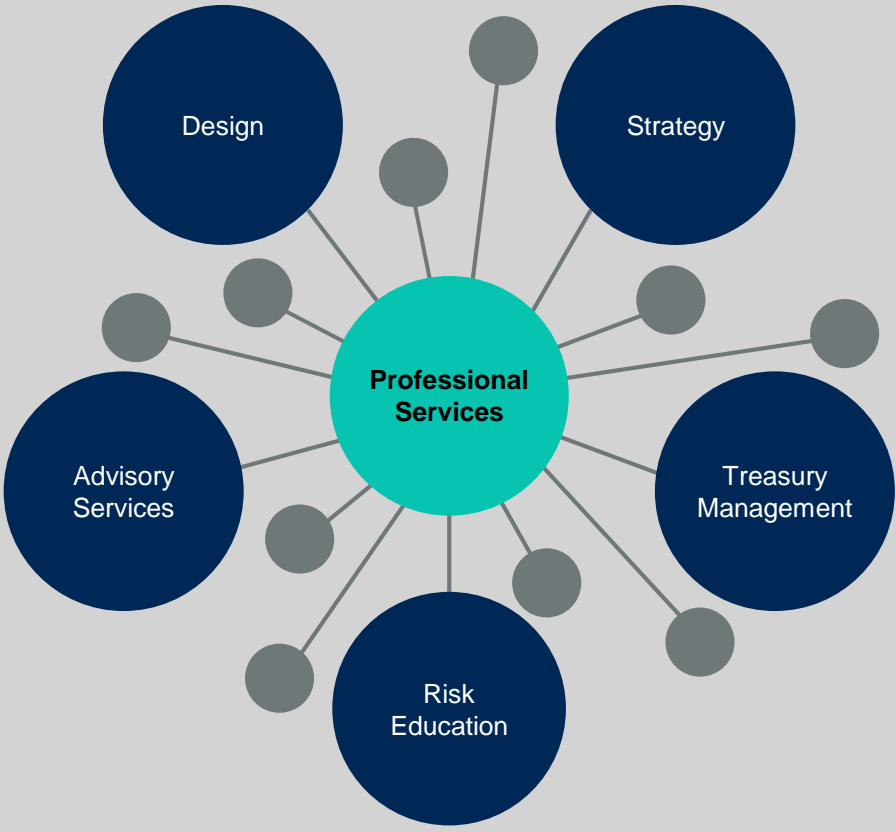
📊 Hiring Difficulty



👥 Most Common Titles With This Skill

Information Security Analyst	Associate Director Security Architecture
Security Engineer	Security Consultant
Network Security Engineer	Cyber Security Engineer
Security Engineer Manager	Manager Security Architecture
Security Analyst	Cyber Security Analyst

🌐 Top Five Skill Adjacencies



Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

Deep Dive: Investigating

🔍 Description

“Investigating” in an information security context refers to the use of tools and analytics techniques to identify and uncover the source of a security incident. *Sample job description language: work collaboratively to identify, investigate, and mitigate security incidents.*

📈 Skill Growth

2.7X (2016-2020)

📊 Hiring Difficulty



👥 Most Common Titles With This Skill

Security Analyst	IT Security Analyst
Information Security Analyst	Information Security Engineer
Security Engineer	Security Specialist
Specialist Agent Cybersecurity Technology	Network Security Engineer
Cyber Security Analyst	Cyber Security Engineer

Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

🔗 Top Five Skill Adjacencies



Deep Dive: Security Operations

Description

“Security operations” in an IT context refers to the activities conducted by the security operations center (SOC) to monitor, investigate, and prevent security incidents. *Sample job description language: 5-7 years of experience with security operations and incident response*

Skill Growth

2X (2016-2020)

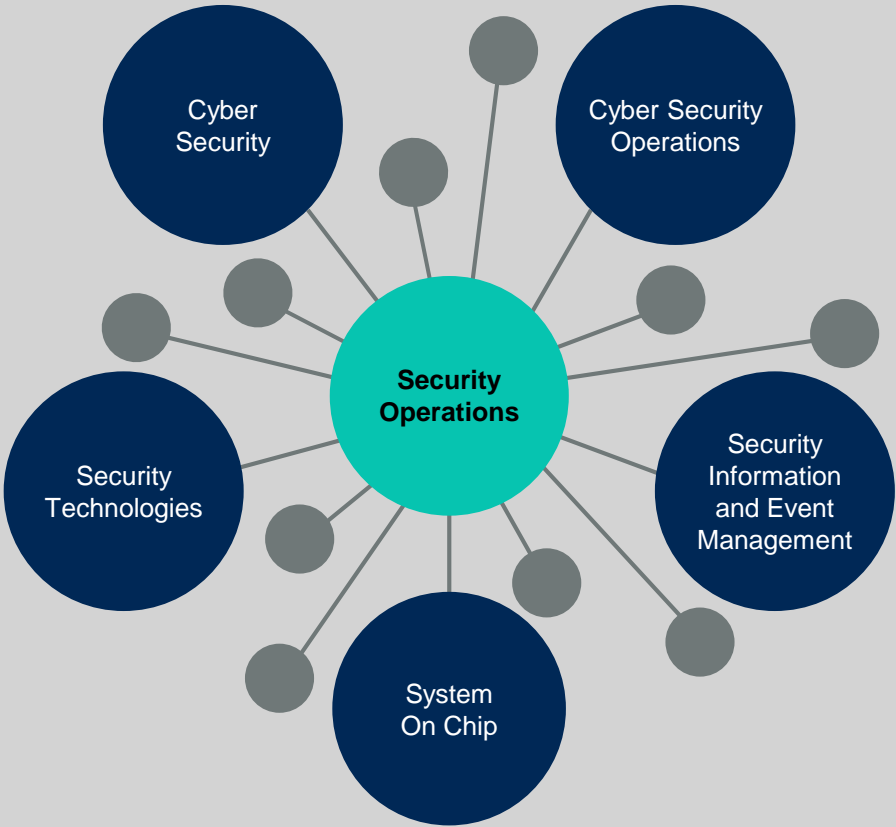
Hiring Difficulty



Most Common Titles With This Skill

Security Engineer	Information Security Engineer
Security Analyst	Network Security Engineer
Information Security Analyst	Soc Analyst
Cyber Security Analyst	Security Operations Analyst
Cyber Security Engineer	IT Security Analyst

Top Five Skill Adjacencies



Source: Gartner TalentNeuron (July 2020)

See the [Glossary](#) for more detail on categories used in this section.

Deep Dive: Programming Languages

Description

A “programming language” is a computer language engineered to create a standard form of commands. These commands can be interpreted into a code understood by a machine. *Sample job description language: Proficiency in a programming language(s) (e.g., C, C++, Python, Go).*

Skill Growth

1.8X (2016-2020)

Hiring Difficulty



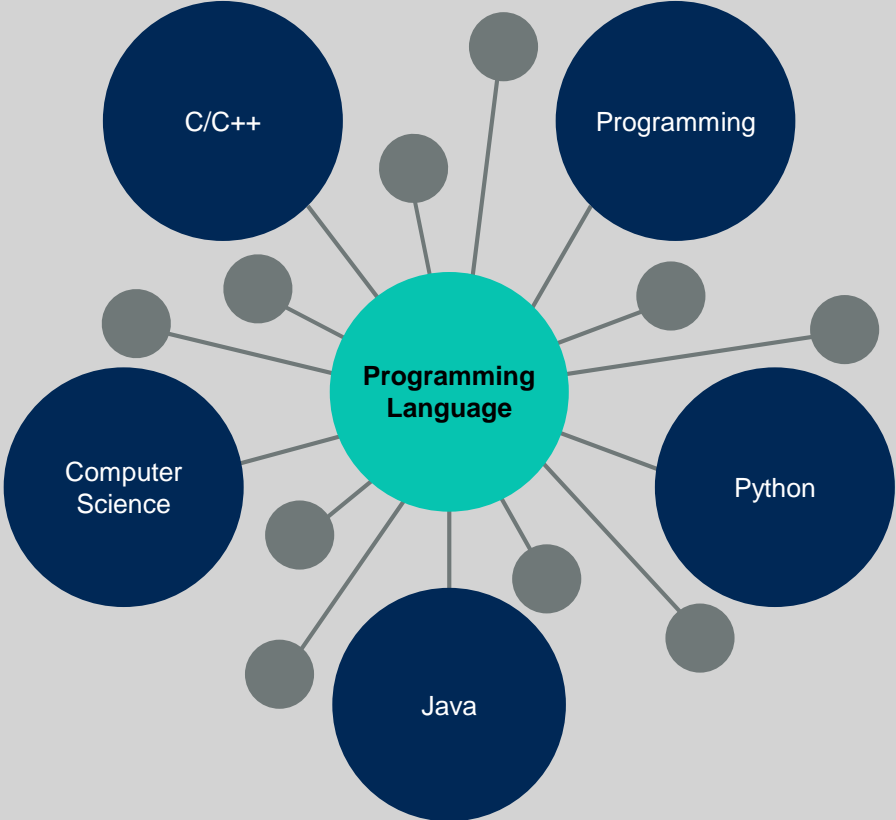
Most Common Titles With This Skill

Security Engineer	Security Architect
Information Security Analyst	Cyber Security Analyst
Cyber Security Engineer	Application Security Analyst
Security Analyst	Network Security Engineer
Senior Information Security Engineer	Penetration Tester

Source: Gartner TalentNeuron (July 2020)

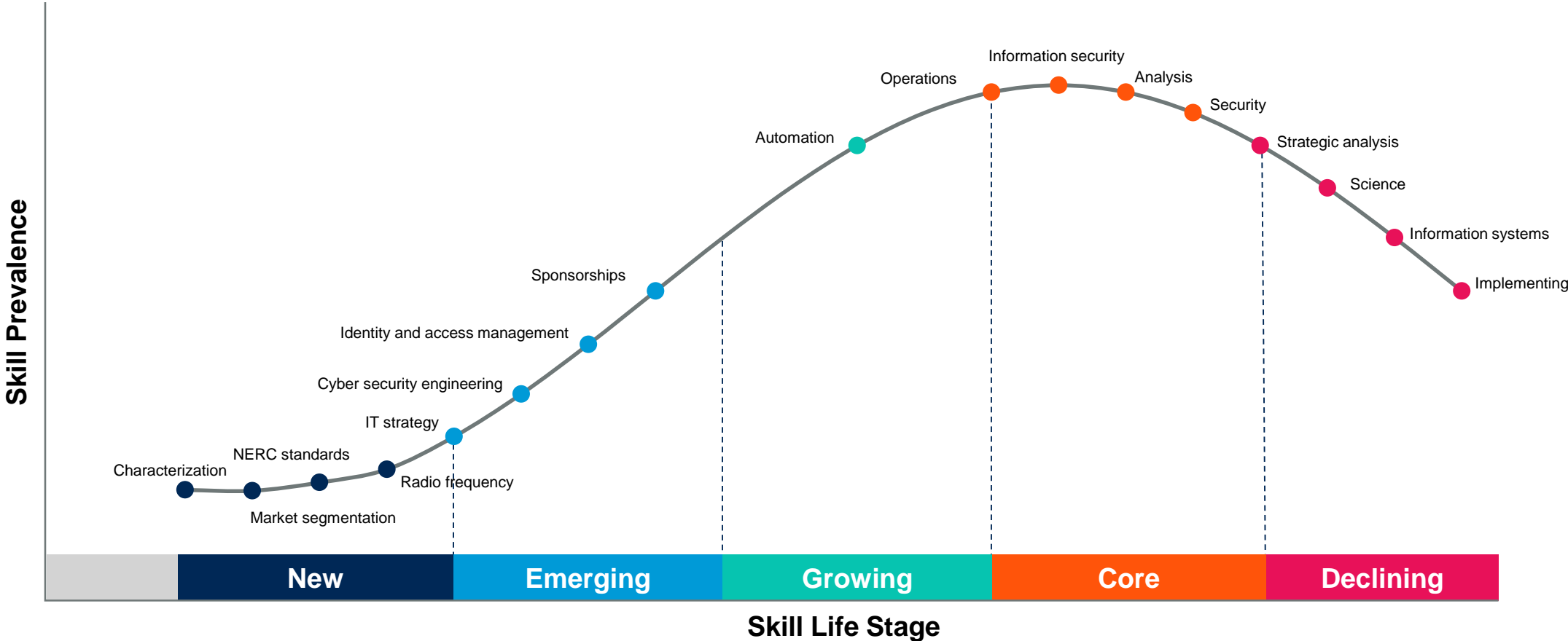
See the [Glossary](#) for more detail on categories used in this section.

Top Five Skill Adjacencies



Information Security Analysts






Skills Life Cycle—Non FAANG+



Source: Gartner TalentNeuron (July, 2020)

Appendix

Glossary

-  **Description:** The description describes the skill in question *as it generally manifests in the context of the role we are looking at in that section of the report.*
-  **Skill Growth:** Skill growth is calculated as the multiple of the percent of postings the skill appeared in during the last twelve months compared to four years ago. For example, if a skill appeared in 10% of postings in the last twelve months compared to only 1% of postings four years ago, the skill growth would be 10x over 4 years.
-  **Most Common Titles With This Skill:** These are based on number of postings containing this skill.
-  **Skill Adjacencies:** Adjacent skills are skills related to other skills in one way or another. Employees with a particular skill would more likely have, or be familiar with, these other related skills. Top Skill Adjacencies are determined by how often skills appear in the same job posting and the uniqueness of this relationship on a scale of 0-1. If you are looking to build a skill internally, employees with adjacent skills could give you a head start.
-  **Hiring Difficulty:** The hiring difficulty score represents how difficult we expect it will be to hire a candidate with this skill for the role in question, on a scale of 1-10. The higher the score, the harder we expect it will be to hire a candidate with that skill. We calculate hiring difficulty by taking into account four different factors: relative supply, typical post duration, change in demand, and competitive concentration:
 - **Relative supply:** Relative supply refers to the proportion of qualified candidates, both employed and unemployed, compared to the demand for those candidates. We estimate the number of candidates matching your search and divide this figure by the number of similar jobs currently open
 - **Typical post duration:** Typical post duration is the number of days that a job posting remains online before it expires or is removed. We calculate the number of days that 75% of similar, closed postings were online for during the past year. We believe that the 75th percentile is more reflective of the recruiter experience than the average or median.
 - **Change in demand:** Demand refers to the number of other similar jobs currently open in a given market. Change in demand is the percent change between the number of similar job postings currently online and the number of similar job postings online during the recent past. To determine whether a change in demand is out of the ordinary, we compare the current number of similar job postings to the number of similar postings 1 month, 6 months, and 12 months ago.
 - **Competitive concentration:** Competitive concentration refers to the level of competition you face in trying to hire a candidate in a particular location. We calculate competitive concentration using the Herfindahl-Hirschman Index (HHI), a well-established measure of market concentration.