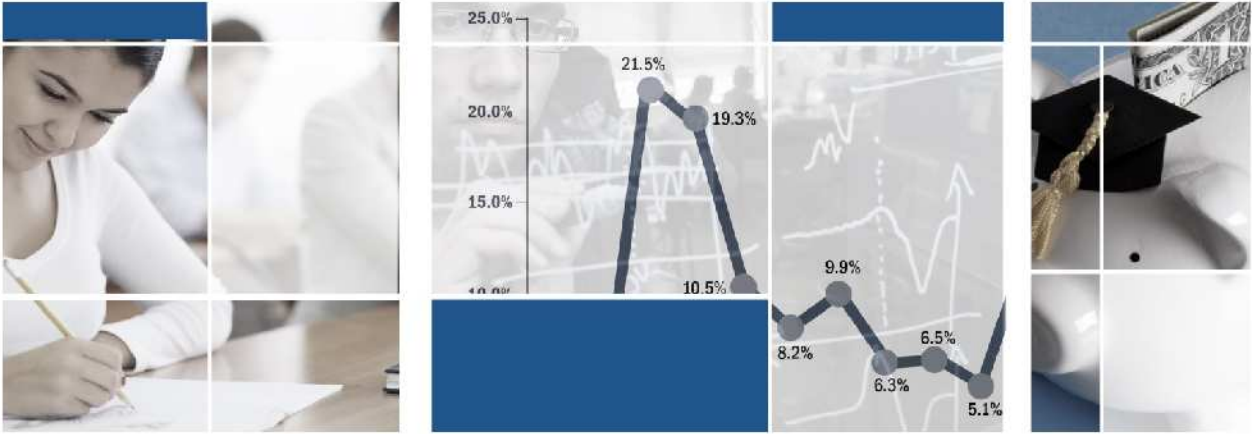March 12, 2019

Commonwealth Cyber Initiative Instructions for Application for Certification of Regional Nodes

VRIC Meeting Date	Certification Application Package Due
June 11, 2019	Tuesday, April 30, 2019, 11:59 p.m.
August 13, 2019	Tuesday, July 2, 2019, 11:59 p.m.
October 8, 2019	Tuesday, August 27, 2019, 11:59 p.m.
December 10, 2019	Friday, October 25, 2019, 11:59 p.m.

STATE COUNCIL OF HIGHER EDUCATION FOR VIRGINIA

VIRGINIA RESEARCH INVESTMENT COMMITTEE

Table of Contents

Introduction

The Commonwealth Cyber Initiative (CCI) was launched through an initial $25-million appropriation in the 2018-20 Virginia biennial budget. The General Assembly called on higher education institutions and industry to build an ecosystem of cyber-related research, education and engagement. The goal is to position Virginia as a world leader where cybersecurity meets data analytics, machine learning and autonomous systems. As required by the General Assembly, the Blueprint for CCI was delivered to the Virginia Research Investment Committee (VRIC) by December 1, 2018. The Blueprint is available here: https://vt.edu/cci-blueprint/index.html

As stated in 2018 Special Session I, Chapter 2, Item 252 B., VRIC is responsible for establishing a process for certifying regional nodes based on a plan for institutional investment, industry partnership, enrollment growth and research focus area.

VRIC envisions first certifying up to four regional nodes that encompass the entire Commonwealth and then potentially expanding to a maximum of five nodes as regional activities mature, develop and grow over time sufficient to merit dividing a region(s) into a new node if funds are available.

Each regional node will organize itself and choose a lead entity, which must be a public institution of higher education. Each node must include at minimum two Virginia public institutions of higher education, which could include both two-year and four-year institutions. Each node is encouraged to reach out to private institutions of higher education that have cyber-related programs that address the goals of CCI.

Institutions of higher education may be members of one node only. Institutions may choose to join a node outside of their immediate geographic area (for example, if the thematic research focus of that node is better aligned to the institution's own research strengths); the advantages and disadvantages of this option should be weighed carefully.

In convening partners to a node, participants should consider aspects such as:

1. Alignment of cyberphysical system security (CPSS) subspeciality expertise
2. Alignment with GO Virginia geographic regions to facilitate access to potential funding for ecosystem capacity building
3. Alignment with regional economic growth and diversification plans
4. Alignment with the outcomes promised in the Blueprint; i.e., ensuring that the partners have the scope of expertise necessary to achieve those outcomes.

Node certification is an iterative process. Applications will be accepted on a rolling basis as shown in the table on the cover of these instructions. As early applicants move through the review and negotiation process, these instructions could be modified.

On behalf of the regional node, the lead institution will **submit a three-part plan** in accordance with the instructions below.

The first part is a narrative describing the commitments that the node is making in the following areas:

- Commitment to CCI research priorities
- Commitment to cyber workforce development
- Commitment to regional ecosystems
- Commitment to CCI Network

The second part will document the regional node partners, provide baseline data and provide evidence of the capacity of the regional node to contribute to the research and education mission of the Commonwealth Cyber Initiative.

The third part is a budget documenting the plan for institutional investment required by the budget language, along with any investments by partner entities. (Part III is not a request for funding.)

The Blueprint references multi-year plans to build CPSS translational research capacity, unique to the strengths of the relevant node, as well as a plan for implementation to operationalize the commitments made during certification. Those plans are not due at the time of certification and should be developed by the nodes over time and submitted with the first request for funding.

Certification serves as a common brand of quality in cyber research and education across the Network. Certification by VRIC will indicate that the regional node:

- Is committed to the vision and programs of CCI
- Includes partners that are qualified to implement the CCI programs of education, research and commercialization, and innovation within the regional ecosystem
- Has secured investments that will fund a base of operations
- Has the expertise right now to represent the Commonwealth and contribute to the CCI mission

Submission Information

The lead institution of a regional node should submit the application package no later than 11:59 p.m. 30 business days prior to the VRIC meeting date at which the application will be considered for certification. Packets should be emailed as attachments in pdf and Excel format to Lynn Seuffert, Associate for Research Investment, at lynnseuffert@schev.edu.

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Part I, the narrative, should be no longer than 15 pages. Part II, baseline data, has no page limit. Part III, the budget and budget narrative, has no page limit.

- Documents may be single spaced.
- Font must be either Times New Roman 12 pt. or Arial 11 pt.
- Margins, in all directions, must be at least an inch; margins for illustrations, graphics, diagrams, or figures that take up a full page may be reduced no smaller than half an inch.
- Pages should be numbered on the bottom right.
- Inclusion of other information in headers or footers is at the discretion of the node.

Contents of Application Package for Certification of Regional Nodes

Part I: Narrative
Maximum 15 pages

This section should describe the proposed regional node's current capabilities and reflect any decisions already made by the collaborating partners regarding how those capabilities will be combined for maximum impact. Detailed plans for the future should not be included. Those future plans will be part of the strategic plan that will be due concurrently with a request for funding.

Please describe the following elements of the regional node:

1. Governance structure
   Describe the governance structure. Include a description of key leadership roles and identify the people who will fill those roles, if known (qualifications of the node director should be provided under #4 below). Include any boards, committees, councils or panels, and any relevant management practices. Describe the frequency of meetings and the responsibilities, authorities or decisionmaking realm of each body. Nodes are encouraged to include representatives from as many partners as possible on the decisionmaking bodies. Please ensure that the governance structure includes mechanisms for cooperation and collaboration with the Hub and other nodes; strategic planning; resource allocation; determining changes to future research directions;

recruiting and integrating new partners over time; resolving disputes between the partnering entities; managing conflicts of interest; self-assessment; etc. **Inclusion of a mechanism for incorporating external expertise is required.** Memoranda of Understanding or other formal agreements between the partnering entities must be complete and fully executed prior to a request for funding. The lead public institution of higher education is accountable for the performance of the entire regional node.

2. Commitment to CCI research priorities
   Describe the subspecialty area on which the regional node will focus; consider summarizing or aggregating relevant information provided in the baseline data in Part II.

3. Commitment to cyber workforce development:
   - State affirmatively that partner public institutions of higher education will dedicate to cyber 50 percent of 2018-2020 biennium budget increase in degree production in data science and technology; provide the six-digit CIP code, CIP title, common program name used by the institution(s), and number of students for each
   - State affirmatively that partner public and private institutions of higher education are committed to innovate and align curricula with industry-driven certifications and standards
   - State affirmatively that all partners to the regional node are committed to enabling and incentivizing experiential learning opportunities
   - Consider summarizing or aggregating relevant information provided in the Talent Pipeline section of Part II
   - Provide a short description of how the node will operationalize the commitments above

4. Commitment to regional ecosystems
   - Identify the regional node director, committed effort percentage, and provide information about qualifications
   - Describe current engagement of regional partners (such as higher education, industry, non-profit and government) and the roles, accountabilities and privileges of the partners; include information regarding what the partners are offering to contribute and what they hope to gain from their participation; consider including information about the history of collaboration among the partnering entities

5. Commitment to CCI Network
   - Describe the regional node's commitment to share data and information with the CCI Network and to participate in Network events
   - State affirmatively that partner public and private institutions of higher education will commit to standards of institutional IT security (e.g., participation in the Virginia Alliance for Secure Computing and Networking). Additional information should be provided in Part II

- Provide a short description of how the node will operationalize the commitments above

Part II: Baseline Data

No page limit. See Appendix.

Part III: Budget and Budget Narrative

No page limit. This section is not a request for state matching funds.

This part documents the "plan for institutional investment" required as a component of certification by the language in the Virginia budget that created CCI, along with any investments committed by partner entities. The General Assembly required that certification occur first, prior to any request for state matching funds. Therefore, a regional node must commit funds first during the certification process, then later apply to VRIC for money to match the committed funds and additional funds secured after certification. The General Assembly further stipulated that matching funds from the state are to be awarded by VRIC under the authority of Va. Code § 23.1-3133, which describes a competitive process, and that VRIC "shall approve or deny the request for an allocation of funds." Therefore, although remote, the possibility exists that a regional node might never be awarded state matching funds or, more likely, might not be awarded funds in the same fiscal year it achieves certification or might be awarded less funding than requested. Therefore, regional nodes should be prepared to expend the funds committed in this budget without a match from the state for as long as it takes the node to be awarded matching funds.

- Any source of funds is allowed (e.g., state funds, remaining funds in start-up packages for recently hired cybersecurity faculty or researchers who will be members of the node, remaining grant funds for ongoing research projects that fall within the scope of the node, the portion of the node director's salary and benefits paid by the institution(s), value of in-kind activities at partner organizations, cash contributions from partners, etc.)
- The investment does not have to be new (see examples above)
- Ongoing investments potentially could count when a request for matching funds is made to VRIC

Please provide a detailed budget for the first year of operations for the regional node. Choose the start date carefully, because that is when the node will begin expending the committed funds, regardless whether matching funds have been awarded by VRIC.

The source of funding for each budget item or budget category should also be identified. Again, this is not a request for funding, rather it documents the plan for "institutional investment" required by the budget language for certification of the regional node. The term "institutional"

has an expansive meaning and includes funding from any source, including partners in the regional node.

The detailed line item budget should include all the usual direct cost budget categories: salaries/wages, benefits, travel, supplies, equipment, renovations/enhancements, rent and other direct costs. Expenditures at each partnering entity should be shown as a single line item in the main budget (similar to a subaward in a grant budget) and a detailed budget for that partnering entity should be included. The main budget should show the total expenditures expected across the regional node.

The amounts for each budget line item should be described in the budget narrative. For expenditures at partnering entities, a separate budget narrative should be included.

Application Processing, Review and Regional Node Certification

Upon receipt via email of an application package, SCHEV staff will respond by return email within two business days to confirm receipt.

Review of applications for regional node certification is a three-stage negotiated process, with opportunities for prospective nodes to clarify or revise their applications.

The first stage is an administrative review by SCHEV staff to ensure that application packets are complete and conform to administrative requirements in these Instructions for Application for Certification of Regional Nodes. If compliance issues are identified, staff will work with applicants to resolve them.

The second stage is review by the CCI Leadership Council to, among other factors, (i) ensure alignment of research capabilities with the CCI vision; (ii) ensure that information provided in the application and the partners that have committed to participate are in alignment with the Blueprint; (iii) ensure that, collectively, as nodes are certified, the outcomes promised in the Blueprint are likely to be achieved. The Leadership Council will negotiate with regional node leadership as necessary. At the completion of review by the Leadership Council, Hub personnel will prepare written comments for SCHEV staff, VRIC members and regional node leadership regarding the strengths and weaknesses of the application and include any other information that will be helpful for the next stage of review.

In preparation for the third stage of review, SCHEV staff may conduct additional due diligence and/or ask applicants for clarifying information.

The third stage is review by the Virginia Research Investment Committee. In compliance with Va. Code §2.2-3711, "Closed meetings authorized for certain limited purposes," these meetings will be closed to the public.

VRIC will vote to certify, certify with conditions or decline to certify regional nodes in a public meeting. This meeting might occur directly following the closed meeting or on a different date.

In the event a node is certified with conditions, the strategic plan to be developed prior to a request for funding should include specific strategies to address the conditions. In the event a node is not certified, feedback will be provided. Hub personnel and the CCI Leadership Council will be available to work with prospective regional nodes on areas identified as needing further development to strengthen the re-application. Alternatively, aspirational node partners will be assisted to join an existing node.

Appendix – Part II: Baseline Data

Section 1: Regional Node Information
<mark>(This section is formatted for legal-size paper)</mark>

Lead Institution:
Name of Node Director:
Title of Node Director:
Percent Effort of Node Director:

Map of Region
Using the map on the next page, outline the counties that comprise your region.

Institutions of Higher Education
Please list the <u>public institutions of higher education</u> participating in the regional node; include the name and title of the person who will lead the day-to-day effort and the estimated annual percentage of effort that person will spend.

Please list the <u>private, non-profit institutions of higher education</u> participating in the regional node; include the name and title of the person who will lead the day-to-day effort and the estimated annual percentage of effort that person will spend.

<u>Each participating institution should fill out the tables in Section 2.</u>

Map of Virginia
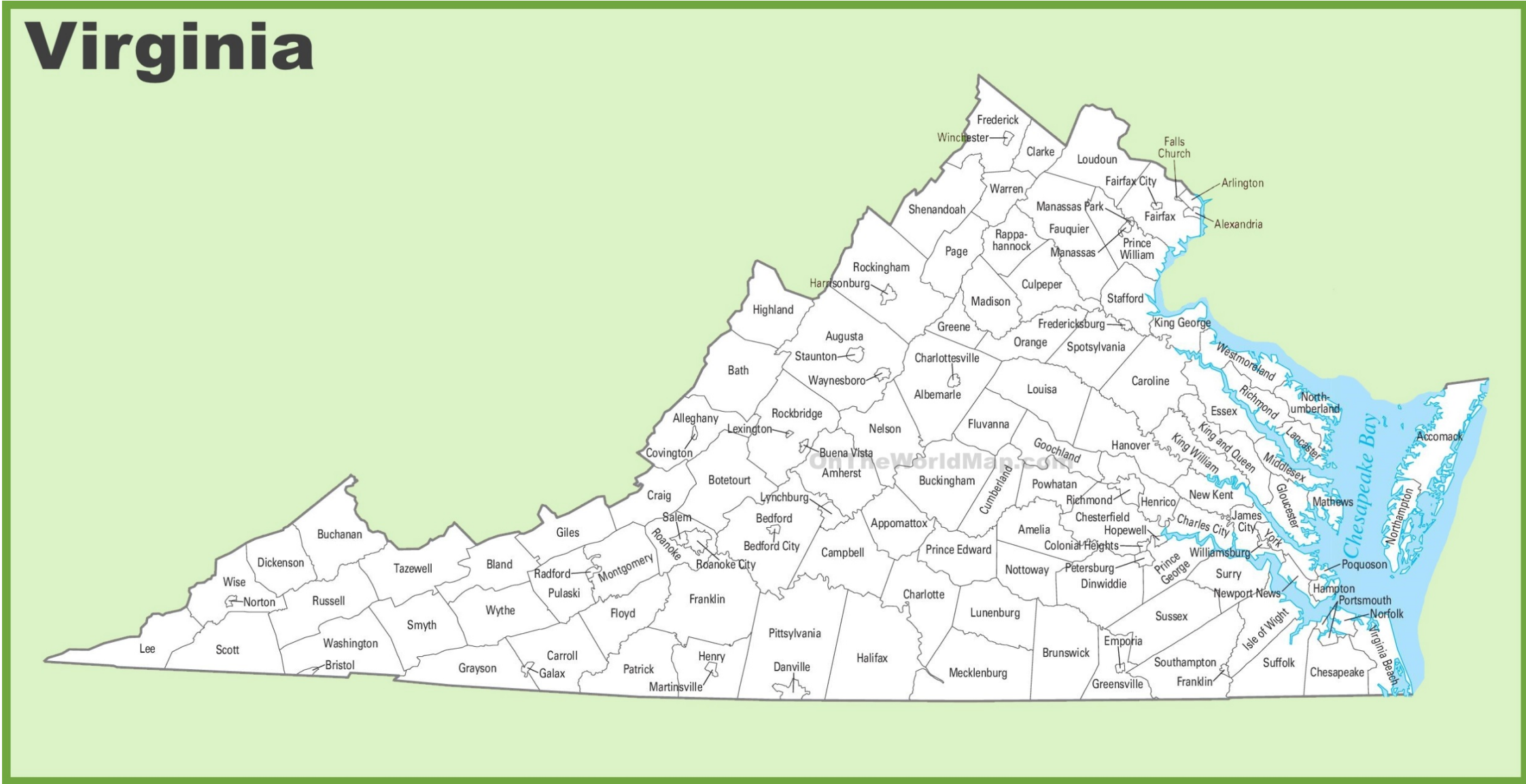
Businesses

This section requests information about business partners, whether those partners are located in state or out of state. For each business partner, please provide as much of the following information as possible.

Business Name	HQ City, State & Local Office (if any)	Number of Employees in Region (if any)	Annual Revenue (specify whether total or regional)	Annual R&D Expenditures from Own Funding (total and in region, if possible)	Annual R&D Expenditures from Other Funding (i.e., federal or other contract) (total and in region, if possible)	Number of Students Hosted for Paid Experiential Learning* at Regional/Local Office in FY2018

* Paid experiential learning includes internships, apprenticeships, research experiences, etc.

Federal Partners

Federal partners could include funding agencies, federal labs or other federal facilities.

Name of Federal Partner	Primary Function in the Node (funder, grantmaker, convener, research, etc.)	Comments: Please provide any information that would help VRIC members understand the nature of this partnership

Other Regional Node Partners

For other non-higher education institution partners, including programs that support the regional innovation ecosystem, please provide the following information.

Organization Name	For-Profit, Non-Profit, B-Corp, Government (not federal)	Describe Primary Function in the Node (accelerator, funder, grantmaker, mentor, convener, industry group, economic development, research, etc.)

Organization Name	For-Profit, Non-Profit, B-Corp, Government (not federal)	Describe Primary Function in the Node (accelerator, funder, grantmaker, mentor, convener, industry group, economic development, research, etc.)

Section 2: Participating Institution Information

(Each institution should complete Tables 1 through 5, Talent Pipeline, and Supportive Infrastructure; provide as much information as possible; if the information is unavailable, please indicate that)

Participating Faculty – Research Effort
The Blueprint estimated that 200 faculty will participate across the network and provided a list of faculty at each institution who are working in the cyber-physical system security domain. Please use the appropriate table below to provide the requested information for faculty members who will be actively involved as formal members of the regional node.

In addition, for each faculty member listed, please provide an NIH- or NSF-style biosketch and a current and pending support form. Biosketches are limited to five pages each.

Table 1: Tenured Faculty

Name	Title	Department & School	See Blueprint, p. 24; list Centers in which faculty is also a member	Appointment Type (12 month, 9 month, etc.)	Average Annual Research Expenditures Over 3 Years As PI*	Annual Research Effort Percent (Total); should align with current support document	CPSS Research (Subset of Total) Either % effort OR expenditure credit in $$	Node Specialty Area (Subset of CPSS) Either % effort OR expenditure credit in $$

* Use an average of extramural funding expended over fiscal years 2015-2016, 2016-2017, and 2017-2018 on research projects for which the faculty member was the PI or the lead researcher at your institution on a multi-institutional project (Co-PI). If two faculty members at the same institution were Co-PIs on a single project, list the expenditures under one faculty member only.

Table 2: Tenure-Track Faculty

Name	Title	Department & School	See Blueprint, p. 24; list Centers in which faculty is also a member	Appointment Type (12 month, 9 month, etc.)	Average Annual Research Expenditures Over 3 Years As PI*	Annual Research Effort Percent (Total); should align with current support document	CPSS Research (Subset of Total) Either % effort OR expenditure credit in $$	Node Specialty Area (Subset of CPSS) Either % effort OR expenditure credit in $$

* Use an average of extramural funding expended over fiscal years 2015-2016, 2016-2017, and 2017-2018 on research projects for which the faculty member was the PI or the lead researcher at your institution on a multi-institutional project (Co-PI). If two faculty members at the same institution were Co-PIs on a single project, list the expenditures under one faculty member only.

Table 3: Non-Tenure Track Faculty

Name	Title	Department & School	See Blueprint, p. 24; list Centers in which faculty is also a member	Appointment Type (12 month, 9 month, etc.)	Average Annual Research Expenditures Over 3 Years As PI*	Annual Research Effort Percent (Total); should align with current support document	CPSS Research (Subset of Total) Either % effort OR expenditure credit in $$	Node Specialty Area (Subset of CPSS) Either % effort OR expenditure credit in $$

* Use an average of extramural funding expended over fiscal years 2015-2016, 2016-2017, and 2017-2018 on research projects for which the faculty member was the PI or the lead researcher at your institution on a multi-institutional project (Co-PI). If two faculty members at the same institution were Co-PIs on a single project, list the expenditures under one faculty member only.

Participating Faculty – Scholarly, Research, and Innovation Output

Collectively, for those faculty listed in the tables above, please provide the following information about their scholarly, research, and innovation output.

Table 4: Recent Activity of Participating Faculty

Activity	July 1, 2014 – June 30, 2015	July 1, 2015 – June 30, 2016	July 1, 2016 – June 30, 2017	July 1, 2017 – June 30, 2018

Activity	July 1, 2014 – June 30, 2015	July 1, 2015 – June 30, 2016	July 1, 2016 – June 30, 2017	July 1, 2017 – June 30, 2018
Total research expenditures in CPSS				
Research expenditures in chosen regional node subspecialty area (subset of figure above)				
Research expenditures in CPSS from industry source (subset of first line)				
Research expenditures in chosen regional node subspecialty area from industry source (subset of figure above)				
Total invention disclosures submitted to TTO (any domain area)				
Invention disclosures submitted to TTO in CPSS domain area (subset of figure above)				
Total patent applications filed (any domain area)				
Total patent applications filed in CPSS domain area (subset of figure above)				
Total licenses executed				
Total companies launched				
Number and value of SBIR/STTR awards to companies included above				
Number of undergrads participating in research experiences with the listed faculty				

Table 5: Cumulative Activity of Participating Faculty – All Research Domain Areas

Activity	2008-2018 (cumulative)	Notes
Patent applications filed		
Patents awarded		
Patents pending		
Licenses executed		
Companies launched		
Number and value of SBIR/STTR awards to companies included above		
Number of exits or IPOs		
Number of high-growth companies*		Please describe your definition of high growth here.

* The Organization for Economic Co-operation and Development (OECD) established a standard definition of high-growth: **"annualized revenue growth of 20 percent or more each year during a three-year period, or 72.8 percent over the entire three years."** Inc. Magazine's Inc 5000 lists companies that have revenue exceeding $2 million in the previous year, and revenue three-years prior to that in excess of $100,000 and that **increased revenue by 43% each year at the median and employment by 35% at the median over the past three years**. Economists at the Census Bureau "demonstrated that firms achieving **one-year growth rates in revenue above 25 percent** account for 12 percent of firms but 50 percent of economy-wide revenue in a given year. Businesses achieving **one-year employment growth above 25 percent** account for 17 percent of firms yet 59 percent of job creation." Source: Brookings: https://www.brookings.edu/research/high-growth-firms-and-cities-in-the-us-an-analysis-of-the-inc-5000/

Talent Pipeline

Please list or create tables showing: (1) cybersecurity-focused degree programs and (2) cybersecurity-related degree and certificate programs (including generalized computer and data sciences programs and cyber-focused specializations, concentrations or tracks) at your institution. Do not include plans for growth or other information about the future of each program. That information will be part of each regional node's future strategic plan. This section should not be a narrative; please use tables or bulleted lists only.

Indicate if the requested information is unavailable (if certified, the node will be asked to include a plan to begin tracking the information as part of the strategic plan).

For each program, please provide the following information:

- CIP code (all six digits) and CIP title
- Common program name your institution uses
- Degree level (associate, bachelor, master, doctoral)
- Cyber-focused specializations, concentrations or tracks
- Number of months or years a full-time student would take to finish the program
- Bundling, for example 3+2 or 4+1 that results in a BS and masters simultaneously; dual enrollment; guaranteed agreements between institutions such as the ADVANCE program, etc.
- Industry certifications embedded in curriculum or certifications for which students are specifically prepared through coursework
- Whether work-based experience is a required program element and what type(s) of experience is allowed
- Current internship employer partners (separate by in-state and out-of-state)
- Number of business partnerships with the program (or school) that might develop into paid internship opportunities
- Annual number of paid interns
- Annual number of unpaid interns
- Number of interns placed at start-up companies
- Whether interns earn credit toward degree
- Whether preparation of students for internships and supportive services for students during internships (related to this degree program) are provided by staff or faculty at the program level OR at the department, school or institution level. (Information about support for internships generally should be provided under Supportive Infrastructure below.)
- Whether the program offers undergraduate research experiences; how many students participate annually; how many of those student experiences were in labs of research faculty listed in the tables in the previous section

- Consider listing recent examples of the implementation of innovative pedagogies in the program
- Consider listing recent institutional investments in the program, such as through recruitment of new faculty, addition of equipment or other resources for student use, etc.
- Fall 2018 headcount
- Number of Spring 2018 graduates and average number of annual graduates (state how many years are used as the basis)
- Average debt at graduation (state how many years are used as the basis)
- Number and percent of graduates working at Virginia companies (state how many years are used as the basis) [available on SCHEV website]
- Post-completion wages of graduates (state number of years after graduation, one, three, etc.) [available on SCHEV website]

Supportive Infrastructure

Research Facilities and Resources

Provide a narrative of the research resources available at the institution that are directly related to the regional node and the chosen subspecialty area. As appropriate, please include lab space, equipment, shared-use cores, technology, training and professional development for both faculty and students participating in research experiences, and other supportive facilities, resources and services.

Technology Transfer Office (TTO)

Please provide the following information regarding the total operations of your institution's technology transfer office for the most recent fiscal year:

- Name of TTO
- Link to website
- Year created
- Name and title of director/lead person
- Number of FTEs
- Number of licensing FTEs
- Annual budget
- Invention disclosures received
- Licenses executed
- Cumulative active licenses
- Patent applications
- Patents awarded

- If the institution outsourced any TTO functions, briefly describe

Internship Support, Career Development and Job Placement

Please describe your institution's infrastructure for support of internships and job placement. Include information about staffing at the program level, department level, school level or institution wide to match students with paid internships, prepare students for those internships, prepare students for job-seeking and place graduates in jobs.

Institutional IT Security

This section requests information to ensure that (1) your institution has an IT security program that reasonably can be expected to protect the reputation of the regional node; (2) your institution is practicing the policy standards and procedures in the security program; and (3) your institution is dynamic in its learning including continued engagement in evolving best practices.

If weaknesses are identified during the node certification process, the regional node's strategic plan will be expected to address those weaknesses. Further, any future collaborative research projects that include shared data or shared computational resources between nodes or between the Hub and nodes will be subject to security standards determined by the entity responsible for managing the data or hosting the computational resources.

Please answer the following questions about your institution's IT security:

1. Name of department, division or office responsible for IT security
2. Name and title of the chief information security officer or other individual responsible for information security in your institution
3. Percent effort this person spends on IT security issues
4. Number of FTEs in the institution dedicated primarily to IT security; include roles of these personnel
5. Annual budget for IT security department, division or office including a brief explanation of what is included in the budget
6. Does your institution follow one or more of the generally accepted international or state-level standards or frameworks for security practices, such as ISO 27001 or 27002, NIST 800-53 or 800-171, Center for Internet Security (CIS) 20 Critical Security Controls, VITA SEC Standards? If so, please name the specific standard(s)
7. Does your institution have a data classification policy or standard that is based on the sensitivity and risk of various types of data? If so, is your institution applying risk based security controls to protect and manage data based on the classification?
8. If your institution does not follow a specific standard, please describe the policies and practices your institution follows. If appropriate, attach your institution's written policies and standards or provide links

9. What type of training do end users receive prior to allowing access to the network and to specific data systems; what are your institution's requirements for refresher training?
10. Are your institution's IT security practices audited regularly by an external entity, such as the Virginia Auditor of Public Accounts (APA)? If so, please provide a summary of any IT-related public findings for the past three audits. Do not include any information that should not be made public
11. Is your institution a member of the Virginia Alliance for Secure Computing and Networking (VASCAN) and/or active in other groups or conferences such as the Research & Education Networking Information Sharing and Analysis Center (REN-ISAC) and the EDUCAUSE Security Professionals Conference? If so, how many IT security personnel attended annual conference(s) offered by those organizations in each of the last three years?
12. What professional development is available to your institution's IT security personnel and what is the annual budget for professional development for the IT security office, division or department?