Tools Security Roadmap

December 17, 2019
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## Impact Details

<table>
<thead>
<tr>
<th>Product - Action Required</th>
<th>Dates</th>
<th>Who May Be Affected</th>
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</thead>
</table>
| ExSchedule & OASIS       | Q3, 2020 | • Users of ExSchedule and OASIS  
                        |       | • 3rd-party Vendors for ExSchedule and OASIS  
                        |       | • Developers of ExSchedule and OASIS Browserless/API code  |

- Obtain valid PKI certificates from approved Certificate Authorities  
- Rewrite Browserless/API authentication code  
- Use PJM provided command line interface (CLI)  

<table>
<thead>
<tr>
<th>Account Manager</th>
<th>Q3, 2020</th>
<th>Who May Be Affected</th>
</tr>
</thead>
</table>
- Associate valid PKI certificates with user account in Account Manager  

- Users of ExSchedule and OASIS
2020 Tentative Roadmap

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<thead>
<tr>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
<tr>
<td>PKI for OASIS &amp; ExSchedule</td>
<td>Development and Testing</td>
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<td>Train &amp; Member Testing: TBD</td>
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<tr>
<td>Browserless/API 2 Factor Authentication</td>
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<td>Prod (Opt-In): TBD</td>
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Prod: TBD
ExSchedule & OASIS Public Key Infrastructure (PKI)

Browserless/API 2 Factor Authentication
• PKI
  – FERC Notice of Proposed Rule Making (NOPR)
  – Implement PKI to provide secure access to
    • OASIS
    • E-Tagging applications (ExSchedule)
  – PJM intends to comply
  – Existing certs that meet NAESB requirements will be accepted
  – When:
    • Train: Q3, 2020
    • Production: Q4, 2020
• **Browserless/API 2 Factor Authentication**
  – Leverage PKI solution
  – **Scope**
    • Included: All PJM Tools that are part of Single Sign On and have Browserless APIs
    • Excluded: ExSchedule and OASIS
  – **When:**
    • Optional in Q4, 2020
    • Mandatory in 2021
• https://www.pjm.com/-/media/etools/security/pki-faqs.ashx?la=en