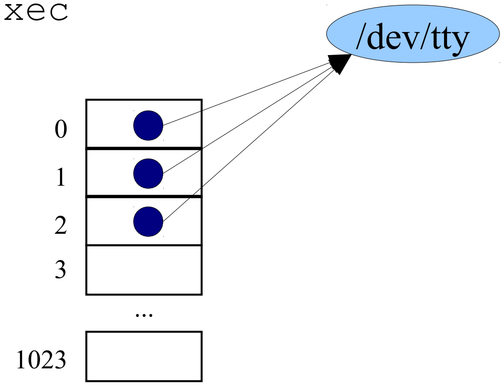
Princeton University / COS 217 / Trace of testdupforkexec

```
% gcc217 testdupforkexec.c -o testdupforkexec
```

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

...

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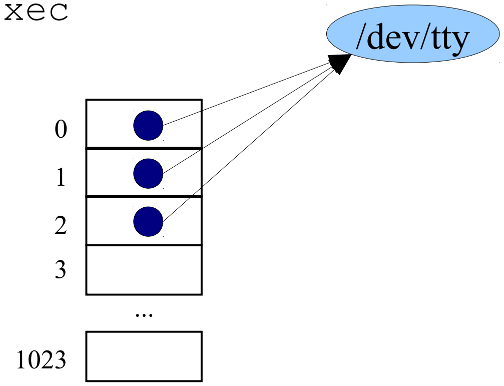

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...

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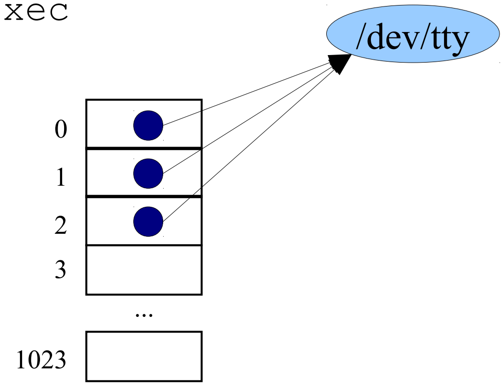

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      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
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}
```

Writes to stdout (alias /dev/tty):

```
1140 parent
```

...

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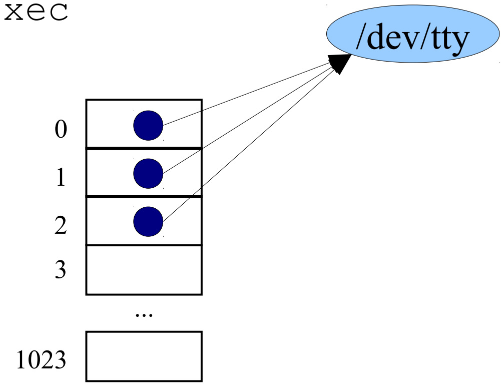
```
% ./testdupforkexec
```



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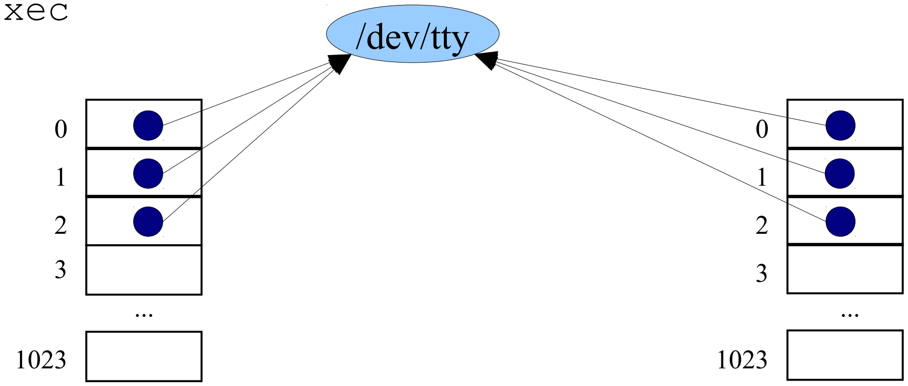

```
int main(int argc, char *argv[])
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   printf("%d parent\n",
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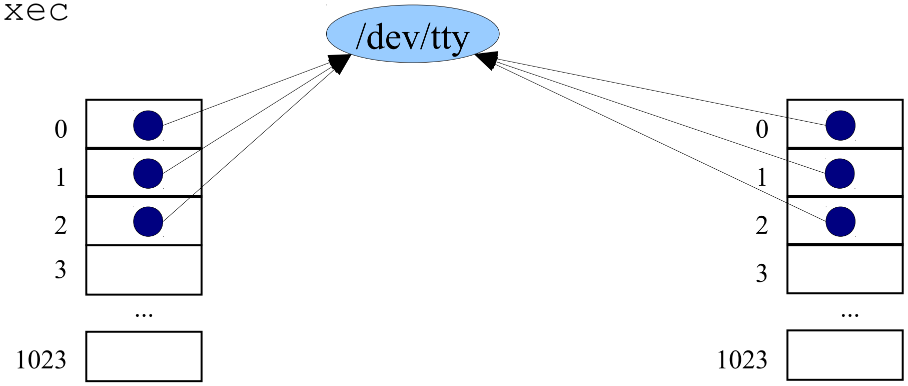
```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
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      perror(argv[0]);
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   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

non-zero

```
int main(int argc, char *argv[])
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      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
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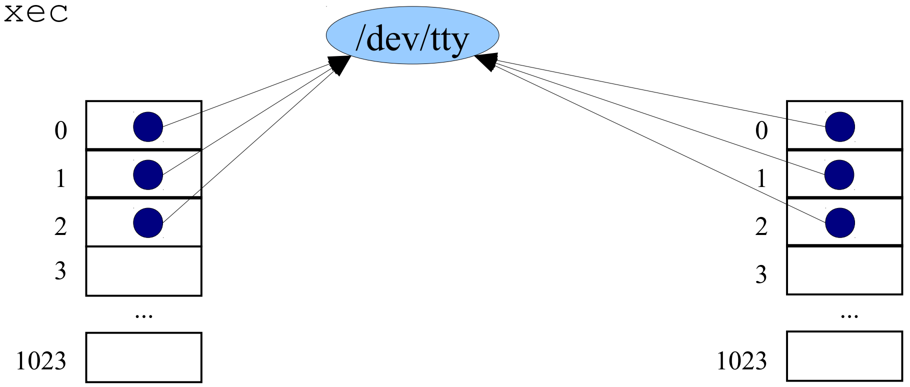
```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
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   iPid = fork();
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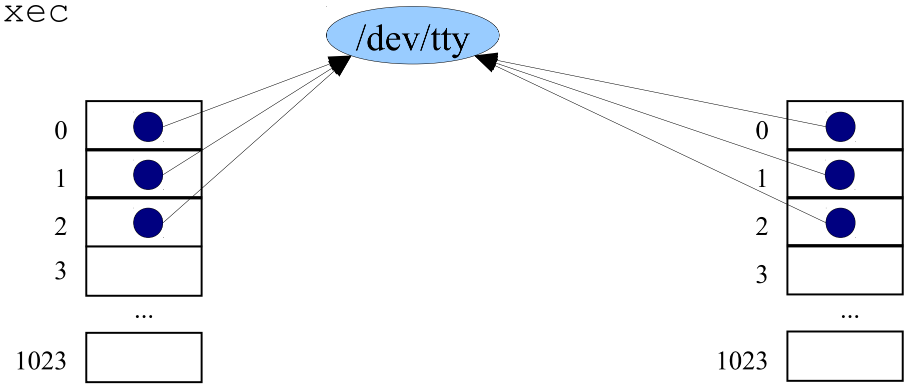
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
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non-zero

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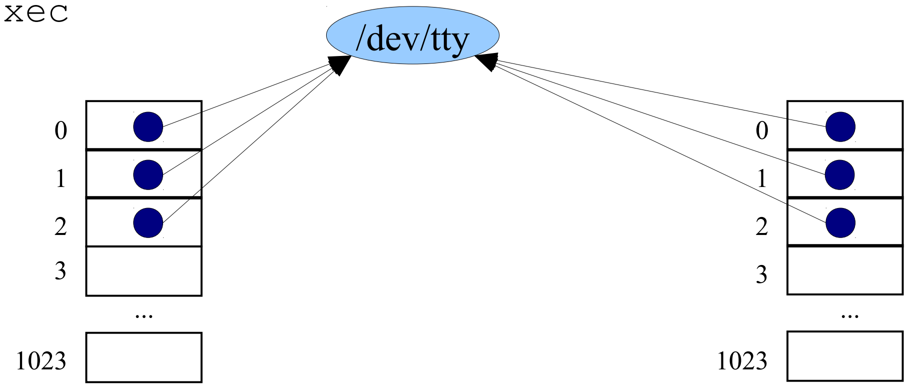

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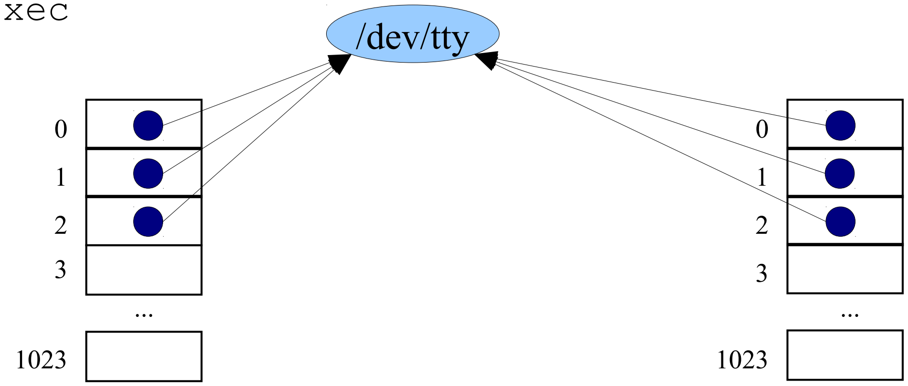

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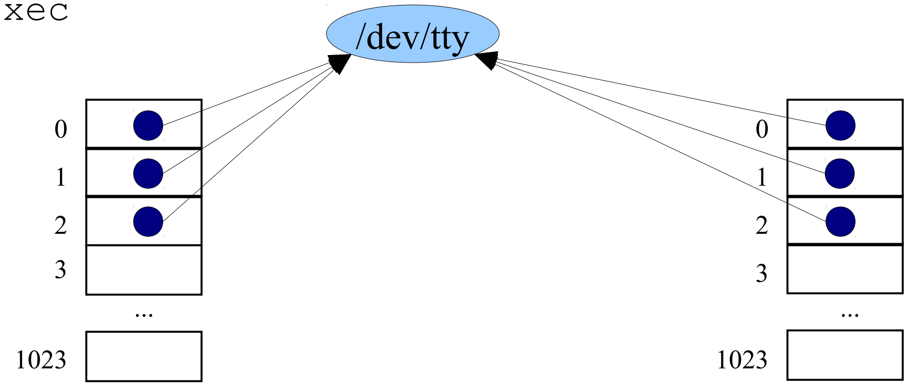

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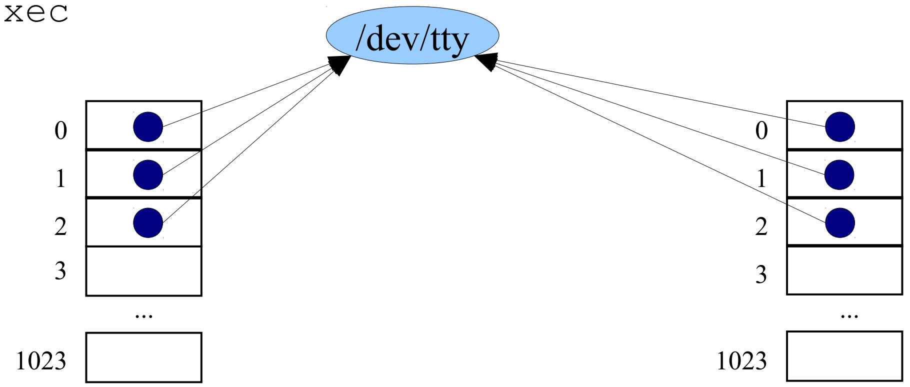

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```
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```

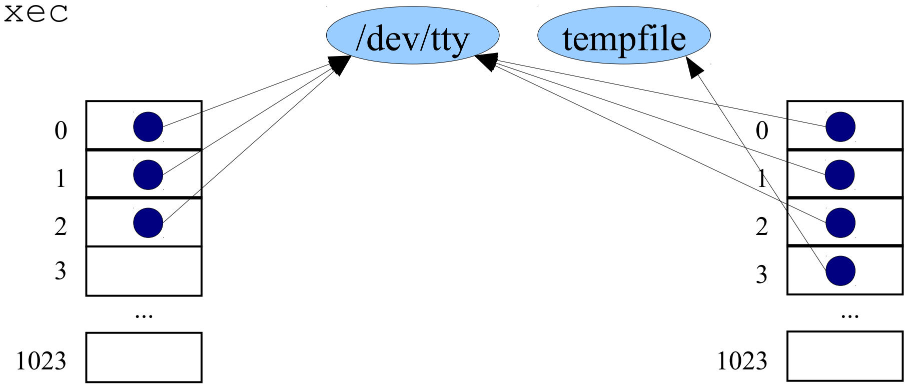

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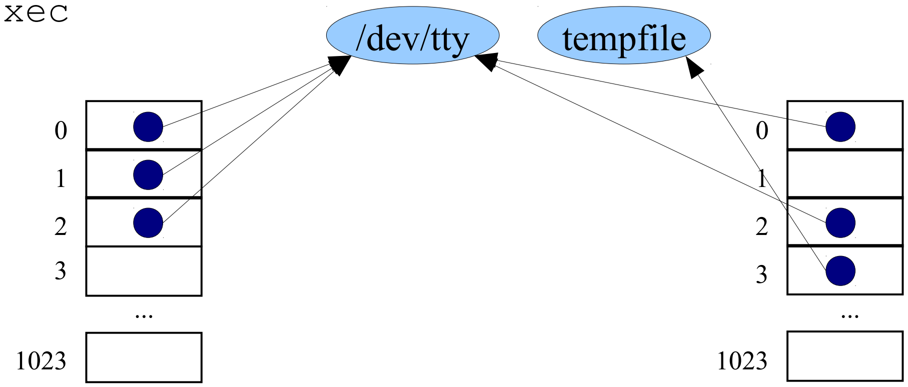
```

0

3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
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   iPid = fork();
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non-zero

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      perror(argv[0]);
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   }
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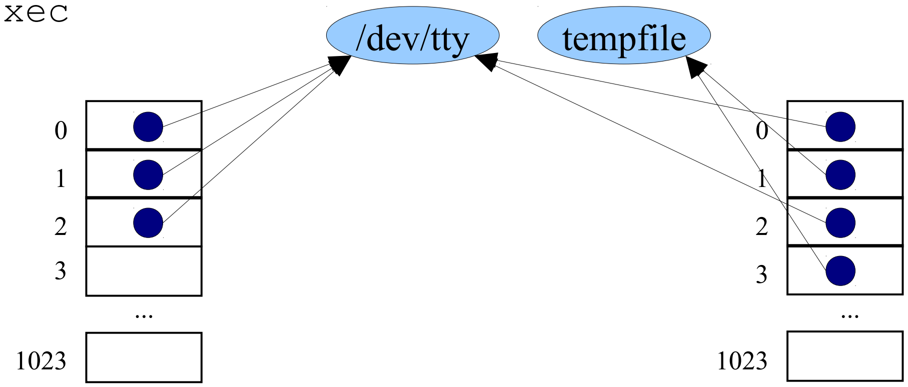
0

3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



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   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

non-zero

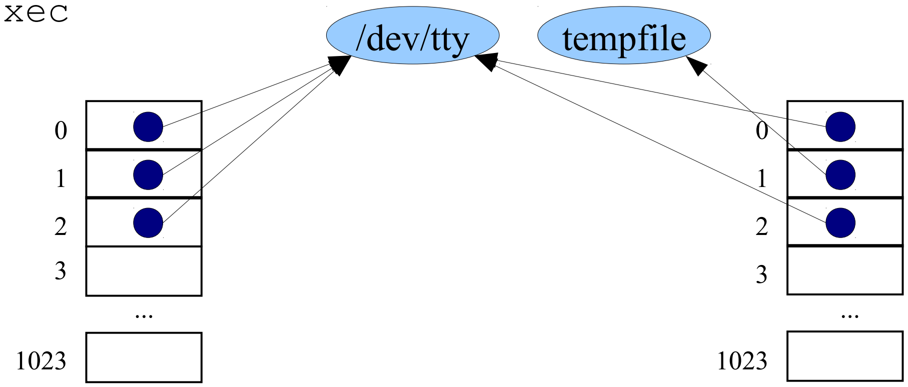
```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

0

3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
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      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
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   wait(NULL);
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non-zero

```
int main(int argc, char *argv[])
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      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
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      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
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      (int)getPid());
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```
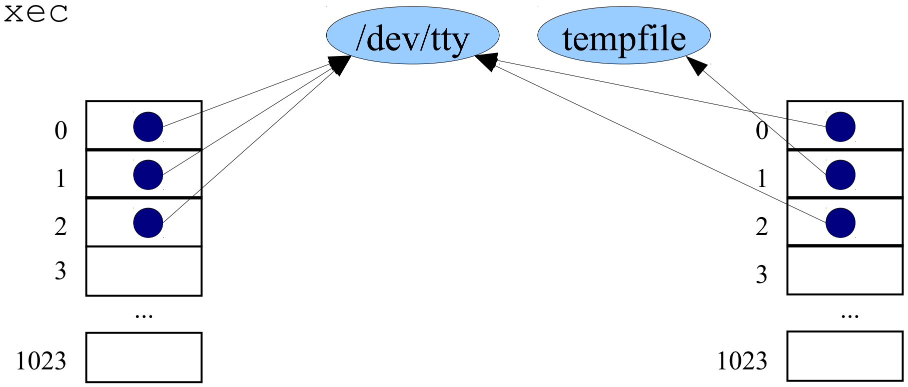

0

3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
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non-zero

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      perror(argv[0]);
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```

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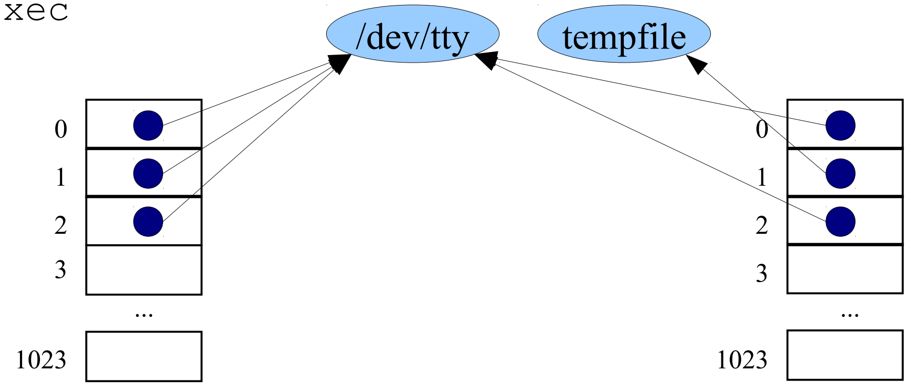
3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
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non-zero

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      dup(iFd);
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      execvp("date", apcArgv);
      perror(argv[0]);
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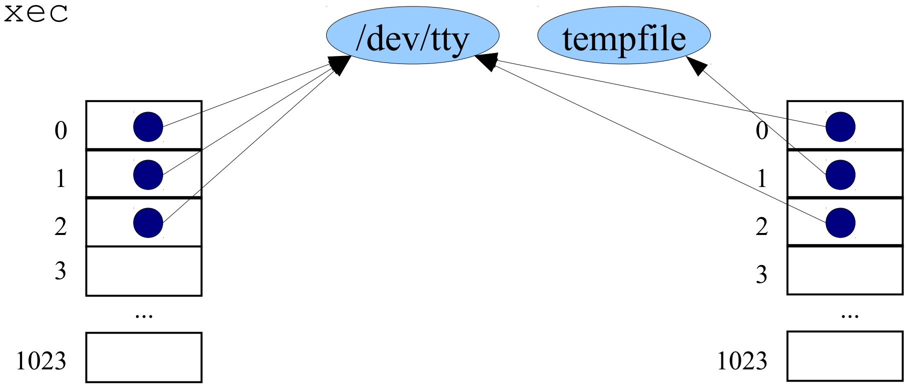
0

3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
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   printf("%d parent\n",
      (int)getpid());
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   iPid = fork();
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   {  char *apcArgv[2];
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      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
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      (int)getPid());
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non-zero

```
int main(int argc, char *argv[])
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      dup(iFd);
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      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```
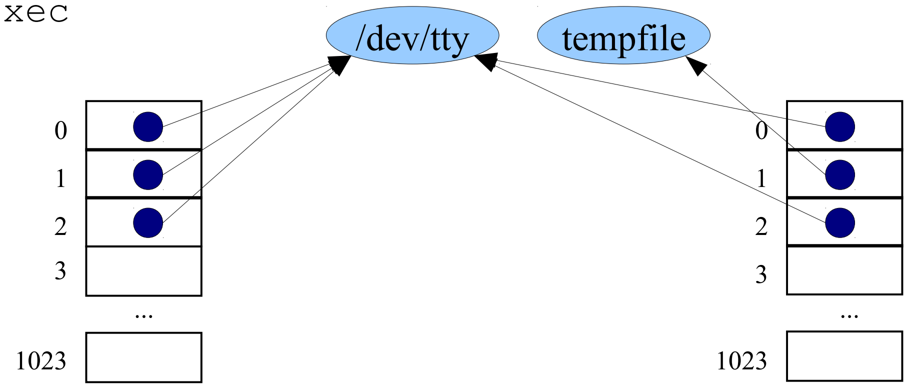

0

3

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



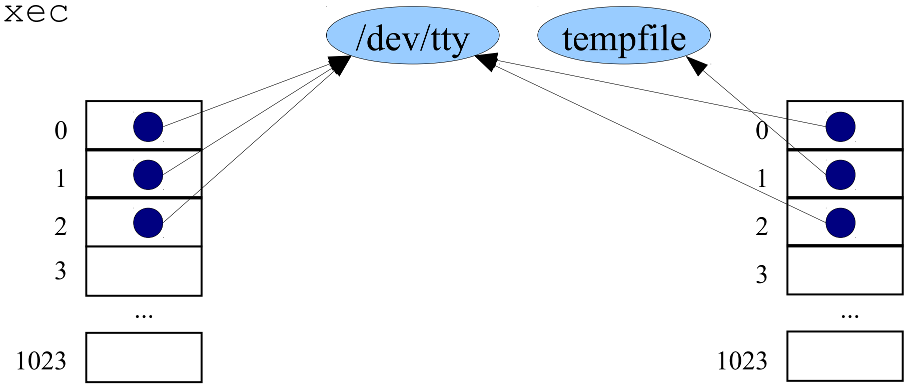
```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

non-zero

```
int main(int argc, char *argv[])
{

               Date
              program



   return 0;
}
```

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

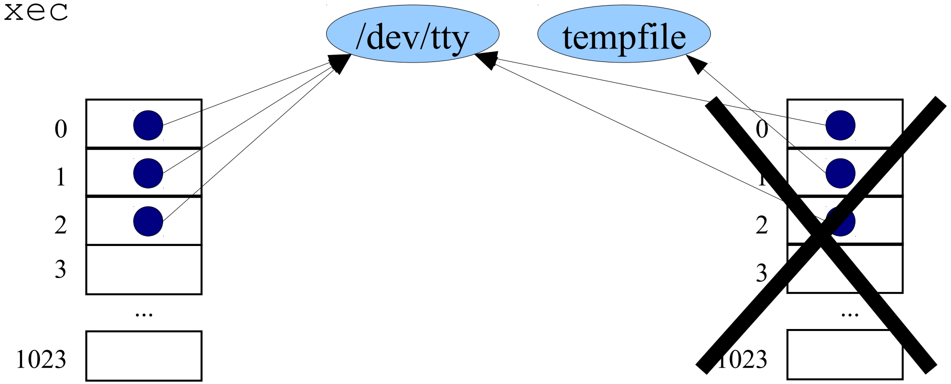
non-zero

```
int main(int argc, char *argv[])
{

            Date
           program


   return 0;
}
```

Writes the current date/time to stdout (alias tempfile)

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



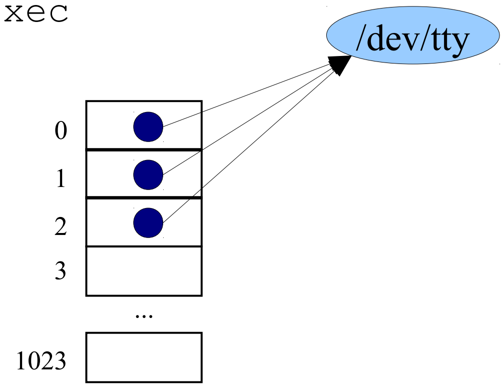
```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

non-zero

```
int main(int argc, char *argv[])
{

               Date
              program



   return 0;
}
```

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
      close(1);
      dup(iFd);
      close(iFd);
      apcArgv[0] = "date";
      apcArgv[1] = NULL;
      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

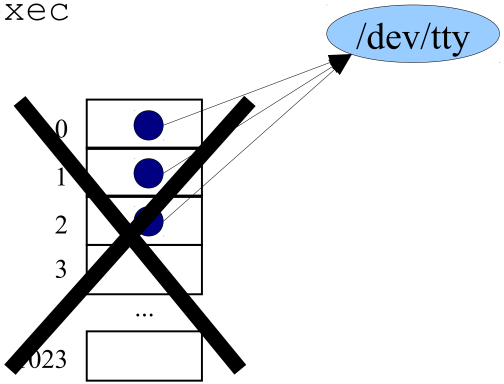
non-zero

Writes to stdout (alias /dev/tty):

```
1140 parent
```

Princeton University / COS 217 / Trace of testdupforkexec

```
% ./testdupforkexec
```



```
int main(int argc, char *argv[])
{  pid_t iPid;
   printf("%d parent\n",
      (int)getpid());
   fflush(NULL);
   iPid = fork();
   if (iPid == 0)
   {  char *apcArgv[2];
      int iFd;
      iFd = creat("tempfile",0600);
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      apcArgv[0] = "date";
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      execvp("date", apcArgv);
      perror(argv[0]);
      exit(EXIT_FAILURE);
   }
   wait(NULL);
   printf("%d parent\n",
      (int)getPid());
   return 0;
}
```

non-zero

```
%
```